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# DOS WORLD

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September 1995 • Number 23

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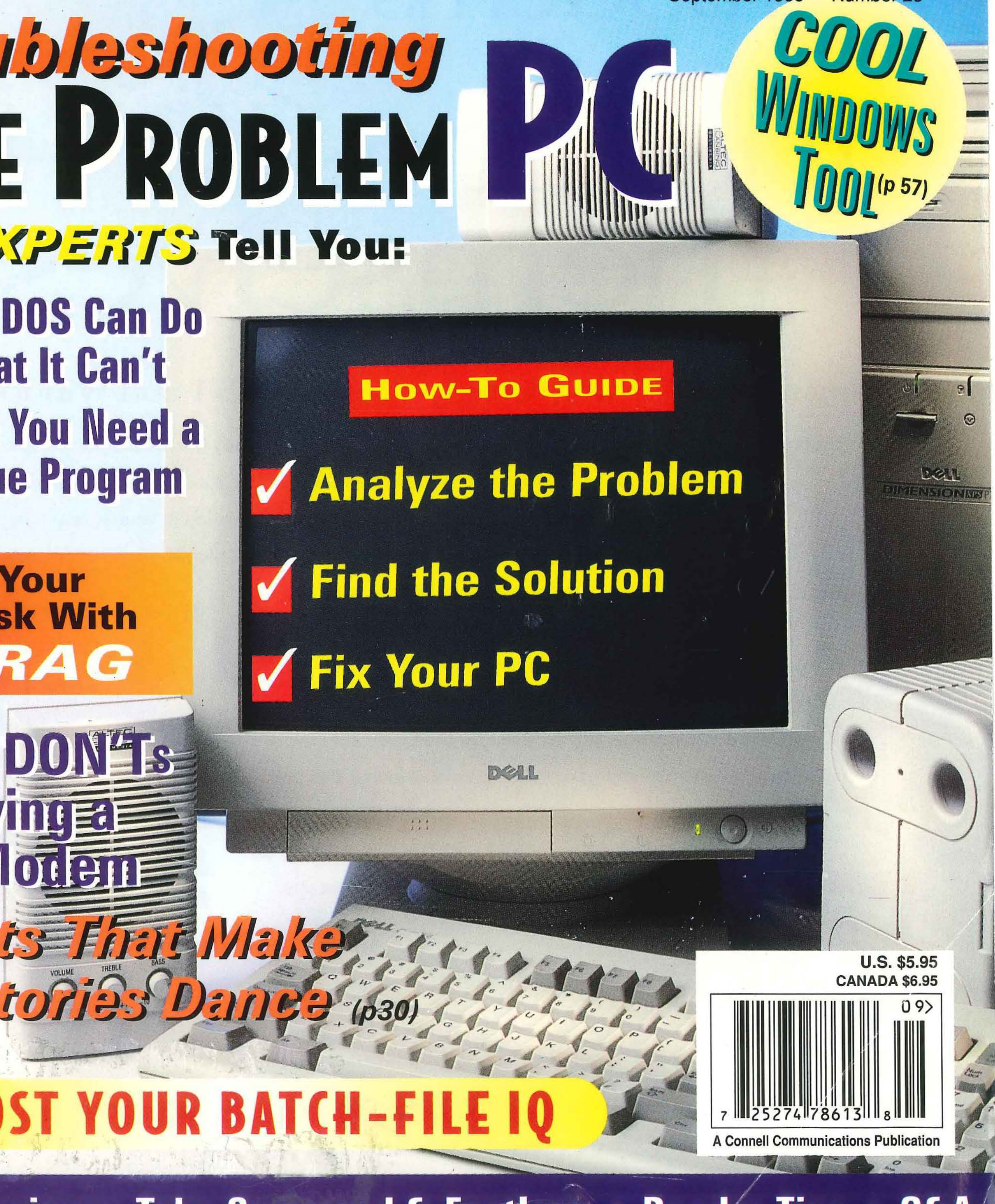

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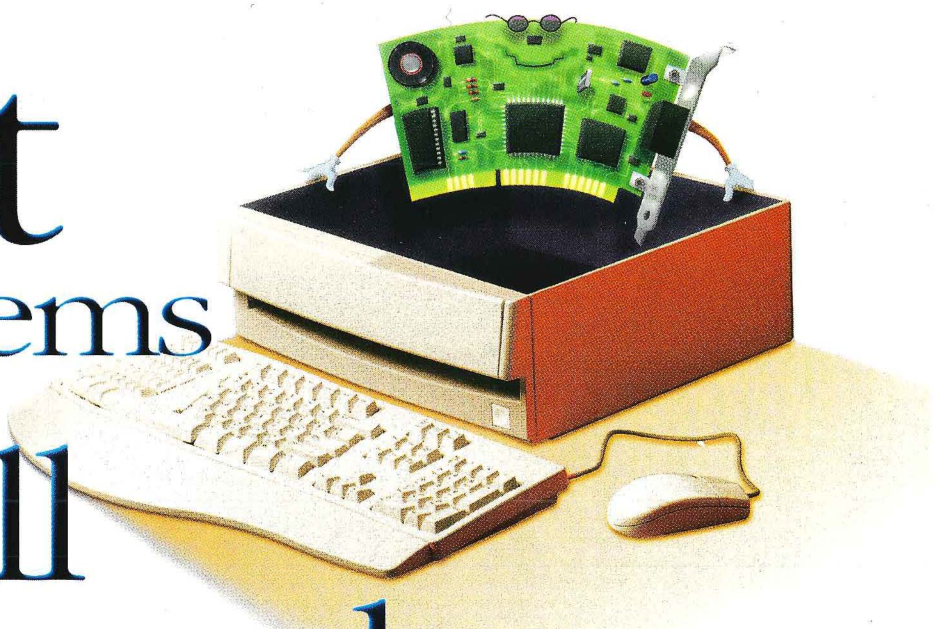

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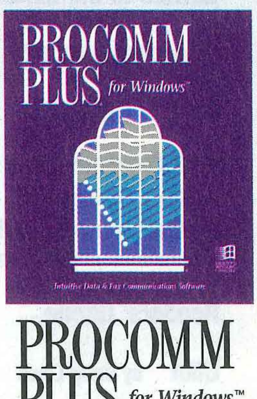

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*Pictured on the cover is the Dell Dimension 575/XPS multimedia computer, a 75MHz Pentium-based system with 16MB of RAM, 1GB IDE hard drive, 4x CD-ROM drive, Sound Blaster 16 audio card, and Altec Lansing speakers. Cover photo by Larry Dunn.*

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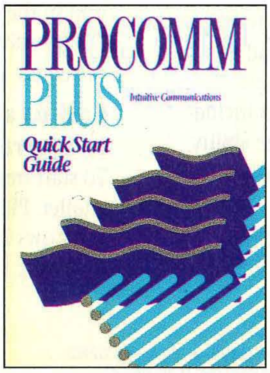

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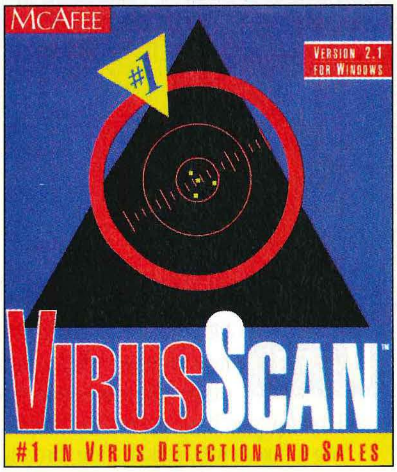

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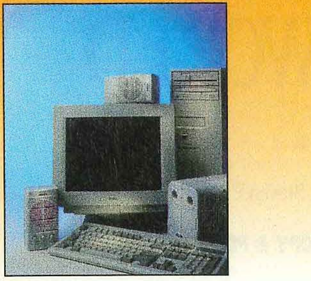

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## How to Contact The Editors

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EDITORIAL

# DOS at a Crossroads With Windows 95

by Michael J. Comendul

You know the old expression: The more things change, the more confused everybody gets. Well . . . something like that. Take Windows 95. The more Microsoft changes how Windows (and, of course, DOS) operates, the more confused the consumer becomes.

Recently, Microsoft changed the way programs handle graphics in Windows 95, and in the process may have made many of today's CD-ROM titles obsolete. Microsoft has developed what it hopes will become a new standard—DirectDraw—and has abandoned its Display Control Interface, which lets programmers increase the speed of graphics in a Windows 3.0/3.1 title. This change affects how programmers create their work, but it affects you and me, too—financially.

According to a recent issue of *Infoworld*, an industry newspaper, multimedia titles that use existing graphics accelerator cards or show film clips using a software technique that emulates the MPEG (Motion Picture Experts Group) compression standard, and titles that use QuickTime for Windows (an Apple standard), "will either run slowly or not at all," under the latest Windows 95 beta.

Graphics accelerator cards, which replace traditional VGA or Super VGA cards, are one of the more popular upgrades for users who run Windows, even on a part-time basis. MPEG software emulation lets users of PCs without MPEG chips enjoy film clips that have been compressed under that common standard. Will such products be rendered useless under Windows 95?

It's too early to give a definitive answer here, yet this development exemplifies a problem of Windows 95 that the media haven't talked about much: Will you need new hardware to enjoy its benefits?

Let's take memory, for example. Microsoft guarantees that Windows 95 will run in 4 megabytes of RAM, but industry wags say that if you're thinking of doing any work employing multiple sessions, you'll be a lot happier with 14MB. The difference is quite a stretch.

Another example: Microsoft says Windows 95 has licked the problem of hardware conflicts among boards and peripherals. Yet, Plug and Play is unknown to any of the hardware currently on the market. If you're hoping to run Windows 95 with a new sound card, but want to get another year of service out of your double-speed CD-ROM and modem, the usual configuration headaches may await you.

I have other questions about Windows 95, but you may have one for me. Such as: Why am I spending time on this issue in a DOS magazine?

Since *DOS World* began publishing, we've covered Windows regularly and see no reason to stop. The emergence of Windows 95 and the possible disappearance of DOS as a separate product, however, mean that *DOS World* is at a kind of crossroads.

We don't plan to abandon our editorial mission to cover DOS, but we'd like to continue offering Windows coverage to those who need it. It's time we asked our readers: What do you think about Windows 95? Will you switch to it? Next issue, we'll run our annual "Reader Survey." Let us know your thoughts. ■

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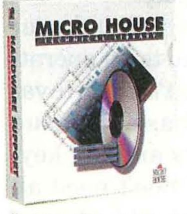

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# Letters to the Editor

## DOSSHELL Not Completely Accurate?

In a tip in your March 1995 issue ["DOSSHELL Adds Up," #20, page 56], Jack Nimersheim says that you can use DOSSHELL.EXE to figure the number of bytes involved before copying files to drive A. This is somewhat misleading, because DOS never shows you an exact number of bytes. For that you need a calculator and the size of your clusters—or a copy of 4DOS. 4DOS tells you the exact number of bytes.

Although DOS (or DOSSHELL.EXE) told me that five files took 9519 bytes, for example, 4DOS said it was 16,384 bytes, with clusters of 2048 bytes on my 120MB drive C. Copying to a 1.44MB floppy disk, DOS figured again 9519 bytes, with 4DOS calculating 11,264 bytes with clusters of 512 bytes each on drive A. My calculator confirmed this.

DOS or DOSSHELL.EXE can indicate only an approximate number of bytes; it can't tell the exact number of bytes as 4DOS can. With 500MB drives and clusters of 8192 bytes, that could mean a big surprise.

*Robert J. de Vlam*
*Ouderkerk-Amstel, Netherlands*

## Electronic Bookmarks

In reference to "Three Ways to Beat the Batch" (*DOS World* #19, January 1995, page 39), here's the perfect solution to your problem. The following program is a 100-percent directory-independent DOS batch file, with no Debugging. Its only requirement is that the external DOS command FIND (FIND.COM) must reside in a directory included in your PATH statement. (That's normally true for most computers, anyway.) Here goes:

```
@ECHO OFF
IF "%1"=="" GOTO SETDIR
IF "%1"=="\" CD %CURDIR%
GOTO END
:SETDIR
DIR | FIND "Directory" >GO.BAT
ECHO SET CURDIR=%%2 >DIRECTOR.BAT
CALL GO
DEL GO.BAT
DEL DIRECTOR.BAT
:END
```

Briefly, this program creates the batch file GO, a one-liner stating "Directory of C:\*whatever*." Then SET CURDIR=%%2 creates the batch file DIRECTOR. When it runs GO, it issues the command DIRECTORY . . . . Because DOS reads only the first eight characters of a filename, it's actually looking for a file named DIRECTOR. Because that exists, it uses OF as %1 and C:\*whatever* as %2. When DIRECTOR runs, it executes SET CURDIR=C:\*whatever*.

This batch file is my adaptation of existing ideas to your problem. Credit for DIRECTOR.BAT goes to Jeff Prosise, an editor at Ziff-Davis Publications.

By the way, Rob Hummel's solution ("Just for Kicks," page 43) is directory dependent, which makes it unsuitable for sharing, as well as slow (because it requires Debugging a script). I like the idea of including a script in a batch file, though; it might be handy for solving some other problem.

*Pedro Gil Lino*
*Faro, Portugal*

## Bring On "Windows Lite"

I'm one of those diehard dinosaurs who has resisted the Windows environment for years. Mind you, I've practically grown up around computers of various types over the past 15 or so years. I'm simply a cautious individual, who also doesn't relish the thought of turning over control of my machine to an application that can't read my mind or ask my opinion of its behavior. For all the "dangers" of DOS, and its undisputed difficulty level, it still leaves me many choices about running my system.

Unfortunately, that effectively locks me out of more and more applications, as increasing numbers of software publishers opt to support Windows only. WordPerfect, for example, has reportedly threatened that it will produce no further DOS-based upgrades. Even Microsoft seems intent on doing away with DOS by scaling back or eliminating development. Some entire categories of software are all but closed to DOS users (presentation graphics and desktop publishing, for example).

Even so, I hesitate to hand over control of my machine to an operating environment that's both invasive and non-text-based. So sue me—I like my letters and my keyboard. In addition, I don't need all Windows' bells and whistles in their current form.

I don't need to run four applications simultaneously, for instance; two will suffice. I'd like to have the option of using some of the new programs that are becoming available, however, such as type-effects software, multimedia, and software on CD-ROM.

Why hasn't Microsoft Corporation tried releasing a "Windows

Lite" or "Windows for the Home" version for those of us who don't need high-powered multitasking or whose equipment isn't quite up to specs yet?

A scaled-down environment would let us conservative dinosaur types take advantage of all the great software packages out there with limited multitasking (and hardware/memory requirements). A "Windows Lite" version should include the following features:

- file management (DOS really stinks there)
- device support (mouse, scanner, and so on)
- TrueType and PostScript support
- standard mode only
- two-window minitasking
- lighter memory requirements, depending on installed options and devices
- WYSIWYG (RAM permitting)
- Object Linking and Embedding
- optional CD/multimedia

As you can see, I've given this plenty of thought, as a consumer. I'm not a programmer, so I don't know about the feasibility of what I propose.

From a marketing standpoint, though, I'd think this would be a boon for Microsoft Corporation.

Think about it: Microsoft would introduce thousands, maybe millions, of potential clients to its product, and finally convert some or all of those holdouts, putting Windows into potentially every home with a PC.

At least some of those customers would ultimately upgrade to Windows 95 or NT or whatever the next generation is. The rest of us would be able to use so many more of Microsoft's products.

*Theresa Pinilla*
*Albany, Georgia*

### DR DOS Has The Right Prescription

I have both a 386SX notebook and a 486DX2S desktop computer. Despite the fact that MS-DOS is considered the industry standard, I've experienced more than enough problems with it, ranging from incompatibility with some older programs to newer ones duplicating files and depositing them in the root directory. One of my databases was constantly losing valuable records, files were corrupted, and my computer crashed frequently—whether I was using DoubleSpace or not.

Fed up with this nonsense, after formatting drives on numerous occasions, I began seeking an answer in some of the older issues of *DOS Resource Guide*. In November 1992 [#6], John Wolfskill's report on DR DOS ["DR DOS 6.0: A Most Worthy Opponent," page 51] impressed me so much that I obtained a copy of DR DOS 6.0.

Since November 1994 I've been a convert, because it's an excellent operating system. I highly recommend it to anyone who is experiencing problems with MS-DOS. DR DOS keeps my computer working properly.

*G. William Johnson*
*Willowdale, Ontario*
*Canada*

### Don't Miss Those Subdirectories

Jack Nimersheim's solution to Homer Tilton's problem with copying one 3.5-inch disk to another on his laptop was good (*DOS World* #20,"Start-Up Clinic," March 1995, page 68), but it won't copy empty subdirectories (such as a data directory) from the original disk.

In addition, the last line is incorrect; the /Y should immediately follow DELTREE; otherwise, DELTREE will still prompt for verification before deleting the directory. The solution would be better written like this:

```
MD C:\HOLDFILE
PAUSE "Place the source disk in
  drive A."
XCOPY A:*.* C:\HOLDFILE /S /E
PAUSE "Place the target disk in
  drive A."
XCOPY C:\HOLDFILE\*.* A: /S /E
DELTREE /Y C:\HOLDFILE
```

*Otto F. Bonaventure*
*Bellmawr, New Jersey*

### Staying Out of Trouble

Since my introduction to *DOS Resource Guide* with issue #12, I've found it satisfying, illuminating, and educational for an old CP/M guy breaking into DOS. I don't seem to be smart enough to operate Windows without getting into deep trouble every time.

In my own system I routinely use some 80 batch and utility files. I compress them into a ZIP file in the C: root to save space, and at bootup expand them all into a RAM-drive directory (in the PATH). Access is then very fast and costs only five seconds in boot time. For me, a 200K RAM drive is adequate. I use batch files here to start programs scattered among directories over two hard drives, and that keeps my PATH minimal.

I'd like to bring to your attention to a small freeware file, JUMP.EXE version 2.0 (10-18-94), just 6336 bytes long, by David Adamson. You can call it within a batch file to insert the current drive and directory into your environment space; it gets you back to wherever you were. Although it's probably available on BBSes, my copy came from J.B. Jones, Librarian, Sun City Center Computer User's Group, 1002 Yellowbird Place, Sun City Center, FL 33573.

*Oscar Bilharz*
*CompuServe 73240,705*

DOS WORLD

# Tips from Readers

## Duplicate Disks on the Double

If you need to make an exact copy of a floppy disk, you can use DOS's DISKCOPY command. Unfortunately, in older DOS versions, DISKCOPY operations often take time and require several disk swaps. In DOS 6.22, though, you can speed up the process by making sure that your AUTOEXEC.BAT file includes this line:

```
SET TEMP=C:\DOS\TEMP
```

This sets up a directory for DOS to use as a temporary file-storage area. When you have a TEMP directory, DOS uses your hard disk, rather than a portion of memory, as a holding area for copying disks. If your hard disk has sufficient space (1.44MB if you're copying a high-density 3.5-inch floppy disk), you need to make just one swap: removing the floppy from which you want to copy and substituting the disk to which you want to copy.

To make DISKCOPY even more efficient, set up a RAM disk: a portion of memory that simulates disk storage. Add this to your CONFIG.SYS:

```
DEVICE = C:\DOS\RAMDRIVE.SYS size
```

where *size* is the number of kilobytes you want to allocate. To copy a 1.44MB disk, you must set aside at least 1475K. If DOS doesn't find enough memory or disk space to store a file's entire contents during a DISKCOPY operation, you'll see "Unable to create image file, will use multiple-pass DISKCOPY." You'll have to revert to swapping disks in and out of your floppy drive.

*James V. Guess*
*Ocean Township, New Jersey*

*Your idea is a good one, provided you work exclusively in DOS. But if you use Windows, we don't recommend setting up a RAM disk to hold temporary files or reserving memory to avoid disk swaps. You'll make more effective use of your memory by employing it to hold a disk cache such as SmartDrive's.* *—Eds.*

## Shorten Your PATH

If you're a Windows user and you need to trim a few characters from your PATH statement, remove the reference C:\WINDOWS;. Except for Windows' principal program file (WIN.COM) and Microsoft's diagnostic program (MSD.EXE, which is usually also available in your C:\DOS directory), you can't execute any of the program files in your \WINDOWS directory.

Because Windows itself doesn't require you to mention its directory in your PATH statement, you can safely delete it. An added benefit is that DOS will have one fewer directory to look through when it's searching for a program you want to execute.

*Darren Natale*
*Clifton, New Jersey*

*In general, you're right. But the C:\WINDOWS directory contains at least one program you might want to start at the DOS prompt: SETUP.EXE. If you delete C:\WINDOWS; from your PATH, be sure to include these lines in the batch file you use to start Windows:*

```
C:
CD C:\WINDOWS
WIN
```

*If you simply use a line such as this:*

```
C:\WINDOWS\WIN
```

*Windows will become confused trying to find WINSTART.BAT and any loader files for which the associated SYSTEM.INI line doesn't include a full PATH. (WINSTART.BAT is an optional batch file that runs whenever you start Windows.)* *—Eds.*

## In the Mode

I have a simple alternative to Technical Editor John Wolfskill's solution for changing your monitor from 40- to 80-column mode ["Q&A," *DOS World* #20, March 1995, page 69]. Mine involves two DOSKEY macros, which I call L and B (for *little type* and *big type*):

```
DOSKEY L=MODE CON COLS=80
DOSKEY B=MODE CON COLS=40
```

With these macros loaded in memory, type `L` to put the screen into 80-column mode and `B` to put it into 40-column mode.

*H. Slaght*
*Brampton, Ontario, Canada*

*Your macros have another advantage, as well. Because both MODE commands clear the screen and its border, you can use either macro to clear a color border left behind by an unruly DOS program.* *—Eds.*

*Submit tips on disk to* DOS World, *86 Elm Street, Peterborough, NH 03458, or electronically via CompuServe* ***(75300,2361)****, MCI Mail* ***(668-4855)****, or the* DOS World *BBS* ***(603-924-3181)****.*

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READER FORUM

# A Cure for the Blahs

by Hardin Brothers

Color monitors and video adapters have been around since the earliest days of the IBM PC. But even after 14 years, DOS still insists on displaying dull white characters on a black background. To take advantage of the sophisticated color system that's part of almost every PC, you have to fight with arcane ANSI commands that should have been relegated to the computer-history books years and years ago.

Our first two questions this month come from readers' battles with ANSI.SYS and their desire to make their computer screens look a little more interesting than DOS's standard monochrome.

> *With just a little fiddlin' and diddlin', you can add a splash of color to snap DOS out of its boring, monochrome funk.*

## Border Crossing

*I enjoy using ANSI escape sequences to change screen and text colors. Is there any way to use ANSI commands to change the border color?*

*Jim Anderson*
*Whittier, California*

The ANSI.SYS version that comes with DOS doesn't include any commands for manipulating border color. Part of the reason may be historical: ANSI.SYS is a subset and adaptation of a more complete set of commands that were defined long before the PC was invented. It's likely that no one at that time worried much about color at all, let alone the color of the border around a text screen.

In the days of CGA (Color Graphics Adapter) video systems, the border was a distinct and very visible part of the screen. Improvements made in EGA (Enhanced Graphics Adapter) and VGA (Video Graphics Array) and it successors use more of the screen for text and, therefore, less for the border. On many systems, the border is barely visible, so modern programs usually don't touch the border at all.

If you use an older program that turns on border color but forgets to turn it off, you can turn it off with ANSI commands in a batch file or from the DOS command line. In a batch file, use a line that resets the screen mode. The following line sets 80-by-25 color-enabled text:

```
ECHO esc[=3h
```

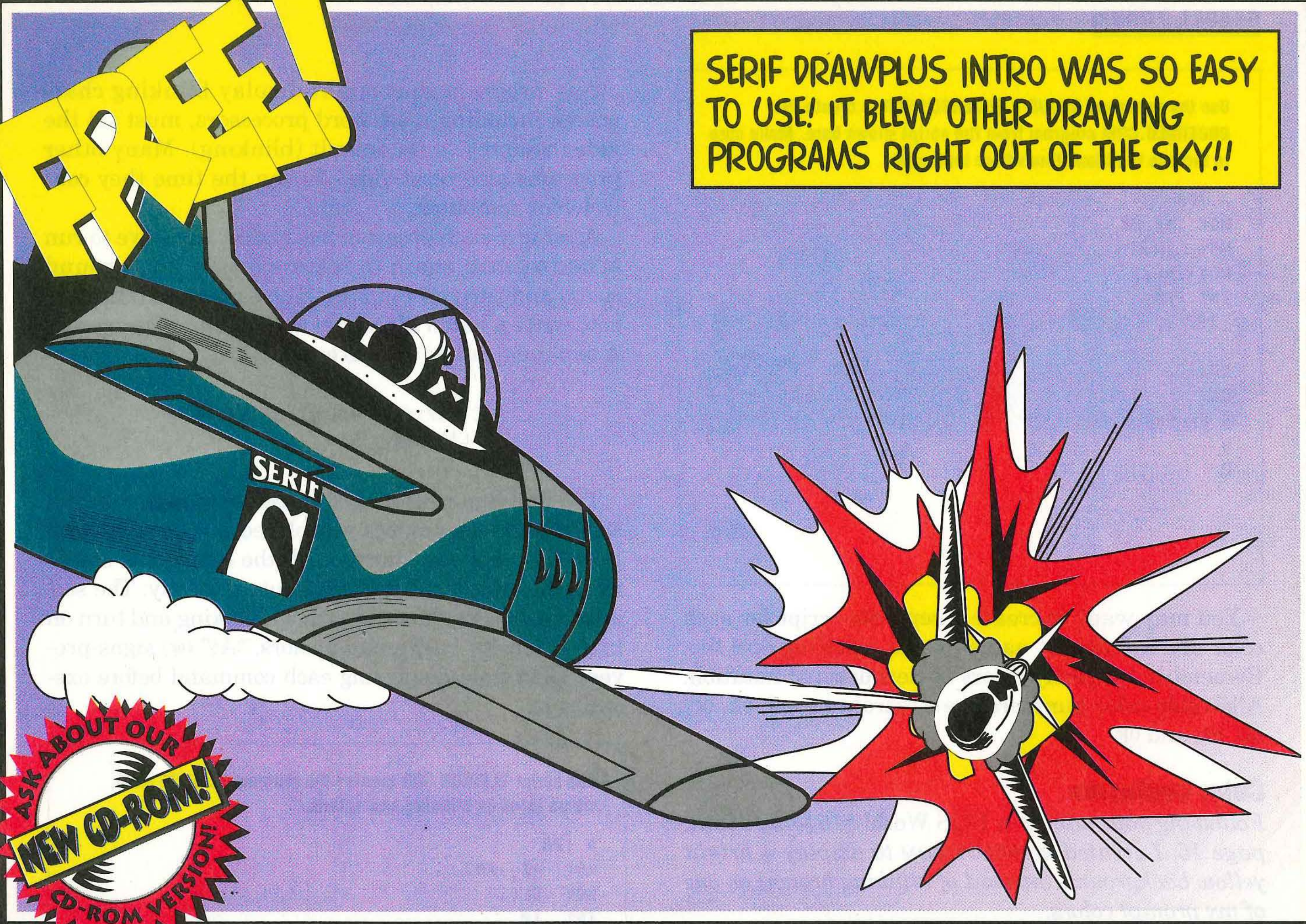
Replace *esc* with the ASCII escape character, which you can create in DOS's EDIT.COM program: Pressing Ctrl+P and then Esc. (And make sure you use a lowercase *h*.) If you want to turn off the border at the DOS prompt or within a batch file without using ANSI codes, use the MODE command to reset the video system; MODE 80, for example, resets it and leaves it in 80-column mode. If you want to set the border color, try the accompanying Debug script, BRDERBLU.COM (page 12). It's a simple program that sets the border to a specific color—in this case, blue. To create it, make sure that DEBUG.COM is in your PATH and use this command:

```
DEBUG < BRDERBLU.SCR
```

You can alter the script to pick the color you want by putting a different color number at the end of the line that starts this way:

```
MOV BL,
```

*Continued on page 12*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**Use the command DEBUG < BRDERBLU.SCR to create the BRDERBLU.COM program from the script shown here. Make sure to include the blank line where indicated.**

```
A 100
MOV  AH,0B
MOV  BH,0
MOV  BL,1
INT  10
INT  20

RCX
0A
N BRDERBLU.COM
W
Q
```

*End*

You may want to create a separate script for each color and a different name for the resulting COM file. Remember to specify colors in hexadecimal notation. Allowable color numbers are 0 (zero) to 9, 0A, 0B, 0C, 0D, 0E, and 0F.

## Color Confusion

*Following your advice in* DOS World *#16 [July 1994], page 15, I created BLINKOFF.COM to display a bright yellow background (instead of blinking brown) as one of my prompt colors.*

*On boot-up, it works fine, and the correct colors return after many programs exit to DOS. But after some programs, notably Microsoft Word 5.5, the screen blinks instead of displaying the bright yellow color. I've tried a number of potential cures, but they don't seem to work.*

*Cody Brant*
*San Diego, California*

In text mode, each character on screen is represented by 2 bytes in video memory. The first represents the shape of the character and the second controls its attributes.

The attribute byte includes 3 bits (eight choices) for background color, 3 bits for foreground color, and a bit that controls foreground intensity. Depending on the state of the video card, the last bit controls either blinking or background intensity. This last bit represents blinking by default.

The programs BLINKON.COM and BLINKOFF.COM (right) change the state of the video card so that it can show either blinking characters or high-intensity (bright) background colors.

If you run BLINKOFF.COM and then use ANSI.SYS commands to turn on blinking, you'll see bright background colors—including yellow in place of brown—instead of blinking.

Any program that might display blinking characters, including most word processors, must set the video adapter to its default (blinking). Many other programs also reset video during the time they control your computer.

After any such program has ended, you have to run BLINKOFF.COM again to restore bright background colors and turn off blinking. The easiest way to do so is to write a batch file to run each offending program. A two-liner can do the job easily:

```
@C:\WP\WORDPROC %1 %2 %3 %4 %5
@BLINKOFF
```

The first line runs a word processor (WORDPROC) and sends it the arguments you placed on the command line. That lets you start it with the name(s) of one or more files you want it to load automatically. The second line runs BLINKOFF to turn off blinking and turn on high-intensity background colors. "At" (@) signs prevent DOS from displaying each command before executing it.

**The script BLINKON.SCR creates the program BLINKON.COM, which turns on blinking characters.**

```
A 100
MOV  AX,1003
MOV  BL,1
INT  10
INT  20

RCX
9
N BLINKON.COM
W
Q
```

*End*

---

**The script BLINKOFF.SCR creates the program BLINKOFF.COM, which produces bright background colors instead of blinking.**

```
A 100
MOV  AX,1003
MOV  BL,0
INT  10
INT  20

RCX
9
N BLINKOFF.COM
W
Q
```

*End*

To accomplish the same goal, you can also use JP Software's 4DOS instead of COMMAND.COM. This shareware program sets screen colors automatically and sets the bright background/ blinking switch each time it returns to the prompt.

## Security Breach

*In* DOS World *#20, March 1995 ("Tips from Readers," page 11), Juan Martinez suggested a technique that wipes out files by overwriting them with* COMMAND.COM. *I believe this tip works with a file of any size. This one's only a two-liner:*

```
@ECHO OFF
ECHO ! > %1
```

*Richard Johnson*
*Cranbrook, British Columbia, Canada*

The original tip suggested copying COMMAND.COM over a file to obliterate its data. Your refinement copies an exclamation mark, plus a line feed and a carriage return, over the first 3 bytes of a file. Both methods make the file difficult to recover with UNDELETE, and your technique works much faster than the original tip. But neither technique completely obliterates the original data, and, in fact, either one may leave all the original data exposed to anyone who wants to snoop around the disk.

When you copy data from one file to another, or when you use ECHO with redirection to create a new file with the same name as an old file, DOS doesn't necessarily put the new data on top of the old. It often (but not always) creates a new file with the new data and marks the area of the disk that held the old data as "unassigned." Sometimes (but not always) DOS doesn't leave the old data sitting on disk. DOS's specific activities seem to depend on its version and the amount of free space on your drive.

The moral of the story is that you should never depend on DOS to obliterate important data from your drives. Programs such as The Norton Utilities' Wipe-Info will give you a pretty good measure of security, but DOS by itself won't. For those of us who work out of a home office with a nonnetworked computer, DOS's lack of security is simply a curiosity. But if you handle sensitive data on a computer others can access, you may want to invest in a utility that will keep the casual office snoop from learning your secrets. ■

*Technical Editor Hardin Brothers has been working with computers and writing about them for 15 years. He also serves as a contributing editor and feature writer for* Maximize *magazine. If you need further help with something that has appeared in* DOS World, *write to "Reader Forum,"* DOS World, *86 Elm Street, Peterborough, NH 03458. Include copies of your* AUTOEXEC.BAT *and* CONFIG.SYS *files on disk if you have problems with software or hardware conflicts.*

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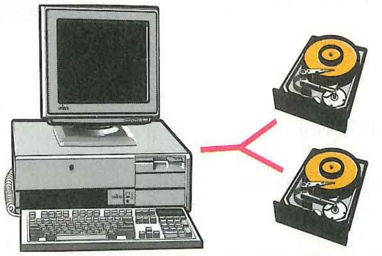

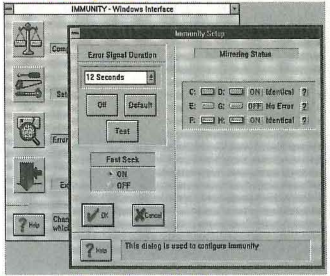

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DOS WORLD

# Best of the Batch

## Extra Protection

Although UNDELETE can be a welcome safety net for recovering accidentally deleted files, it can also be a tool for snooping coworkers who want to recover confidential material. PURGE.BAT (below left) gives you some extra protection by replacing the file with a selected message before deleting it.

PURGE.BAT lets you specify up to nine files to delete and also permits wildcards. Either of the following formats is valid:

```
PURGE FILE1.TXT FILE1.DOC FILE1.BAK
PURGE FILE*.*
```

The heart of PURGE.BAT is the FOR...IN...DO, which grabs a file you want to delete, calls itself, and jumps to the routine KILLALL.

Here, PURGE.BAT processes the file, replacing it with the message "File purged!" and deleting it. If someone tries undeletes the file, all it will contain is the "File purged!" message.

Note that PURGE.BAT doesn't delete data from the disk; it simply removes any pointers to that data. A knowledgeable user with a good disk utility can still retrieve the information. But PURGE.BAT will give you an extra level of protection against casual intrusion.

*Donald W. Rackley*

**PURGE.BAT deletes files so that prying eyes can't recover them with the UNDELETE command.**

```
@ECHO OFF
IF "%1"=="GETRIDOFIT" GOTO GETRIDOFIT
IF "%1"=="" GOTO HELP
CLS
ECHO ---=[ WARNING!  WARNING!  WARNING!  ]=---
ECHO PURGE.BAT will permanently delete
ECHO the following files:
ECHO %1 %2 %3 %4 %5 %6 %7 %8 %9
ECHO.
ECHO Once this runs, these files
ECHO will be gone forever.
ECHO Undelete won't retrieve them.
ECHO.
ECHO Press Ctrl+C now to end this job, otherwise
PAUSE
:KILLALL
FOR %%A IN (%1) DO CALL %0 GETRIDOFIT %%A
SHIFT
IF "%1"=="" GOTO END
GOTO KILLALL
:HELP
ECHO PURGE.BAT will ensure that deleted files
ECHO stay deleted.
ECHO Type PURGE followed by up to 9 filenames.
ECHO Wildcards are allowed.
ECHO For example:
ECHO PURGE TEST?.PRG CUSTOMER.021 *.BAK
GOTO END
:GETRIDOFIT
ECHO File purged!>%2
DEL %2
ECHO %2 purged
:END
```

*End*

## AN ALTERNATIVE APPROACH

If you don't need the message with which PURGE.BAT replaces a deleted file, GETRIDOF.BAT (below) does essentially the same job.

The main difference is that GETRIDOF.BAT removes the contents of the file and deletes it in one step. The trick is that the program copies the device PRN to the file. Logically, the command looks like this:

```
COPY PRN filename.ext
```

If you undelete the file, it will be empty, listed in your directory as containing zero bytes. Note that GETRIDOF.BAT uses the same syntax as PURGE.BAT.

**—Eric Maloney**

**GETRIDOF.BAT erases a file's data and deletes the file itself in one step.**

```
@ECHO OFF
:KILLALL
FOR %%A IN (%1) DO COPY PRN %%A>NUL
SHIFT
IF "%1"=="" GOTO END
GOTO KILLALL
:END
```

*End*

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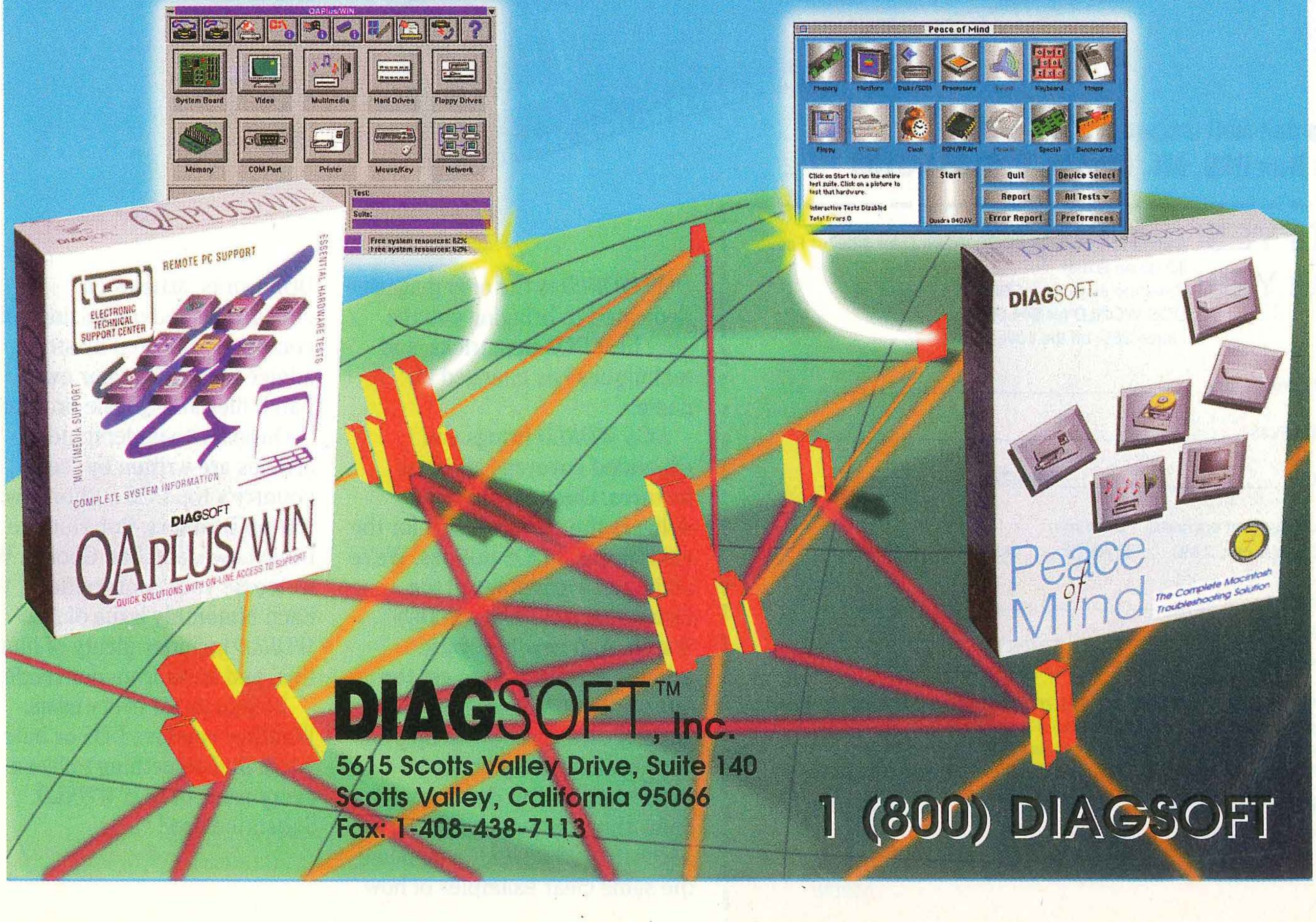

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Free system resources: 62%

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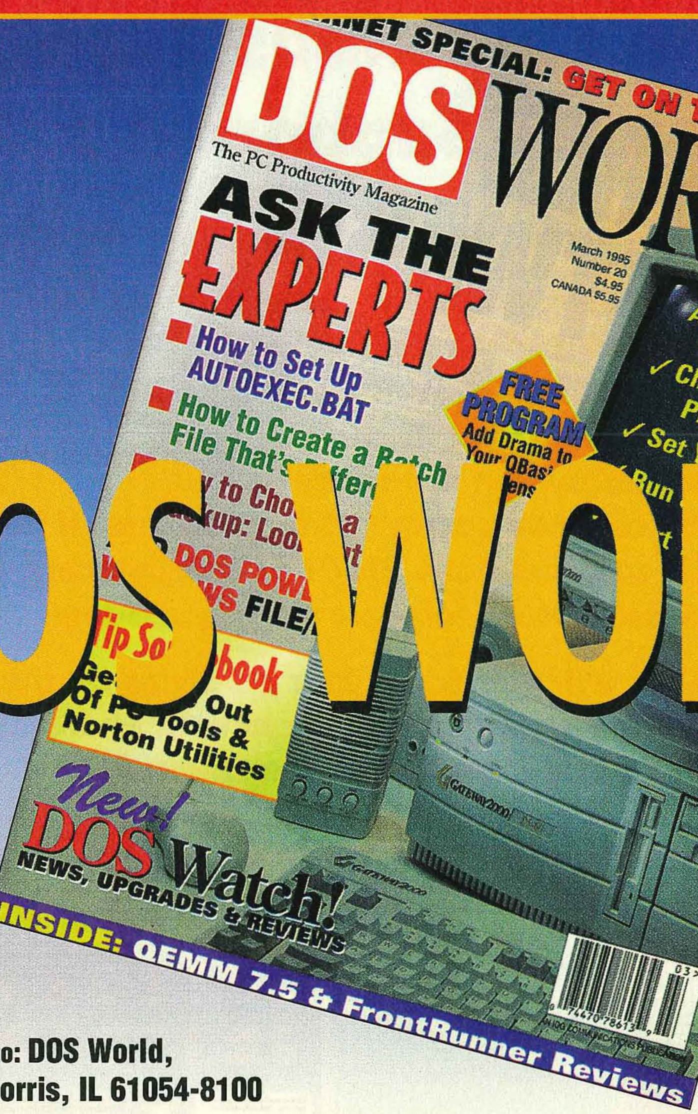
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DOS WORLD

# DOS Program Hints and Tips

**by Anne Fischer Lent, Stan Miastkowski, and Robert Gryphon**

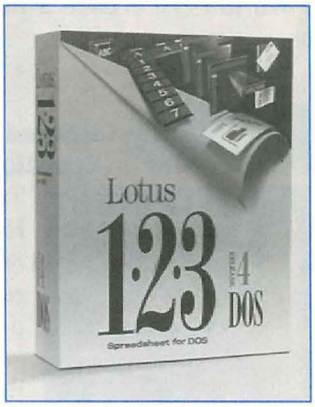
Whether you're a new user of the most popular DOS applications or an old hand, chances are you're not taking advantage of all your software can deliver. Every application has its neat tips, tricks, and shortcuts that can make your life easier, save keystokes, and (best of all) increase your productivity. But finding these time-and-effort savers isn't always easy. You might have been using a popular DOS program for years without realizing what gems lie hidden in seldom-used help files and manuals. Here are 24 hints that will show you how to get the most from your favorite DOS applications.

### TIP #1 Lotus 1-2-3 Release 4 for DOS: Finding Functions Fast

At-sign (@) functions are your most essential spreadsheet tools. These built-in formulas perform complex calculations automatically. With more than 200 functions available in Lotus 1-2-3, however, it's not always easy to remember an exact name. To find the right function, type @ and press F3. 1-2-3 displays a list of all @ functions; just scroll to the one you want and select it. The software inserts the function name into your worksheet, with an opening parenthesis if the function requires arguments. (Add a closing parenthesis in that case.)

### TIP #2 Lotus 1-2-3 Release 4 for DOS: Recalculating What-Ifs

Solving "what if" problems is one of the major reasons spreadsheets have become ubiquitous business tools. Lotus 1-2-3 Release 4 for DOS makes exploring the analysis of multiple variables nearly automatic by including special "What If" tables you access from the /Data Table menu.



Lotus 1-2-3 doesn't automatically recalculate values in what-if tables when you recalculate your main worksheet, though. To recalculate the most recent what-if table after you change values in your main worksheet, either repeat the /Data Table command or press F8 (Table), which lets you change values and then use the new values to recalculate the what-if table without using the menu.

*Anne Fischer Lent and Stan Miastkowski have coauthored two books, the most recent being* The Windows for Workgroups Bible *(Addison-Wesley, 1993). You can reach them on the Internet at* ***alent@bix.com*** *and* ***stanm@bix.com****, respectively. Robert Gryphon is a free-lance writer and programmer/analyst. Contact him on CompuServe at* ***70541,3420****.*

### TIP #3 Lotus 1-2-3 Release 4 for DOS: Custom Graph Colors

Lotus 1-2-3 can make those rows and columns of numbers easier to interpret by turning them into a graph via the /Graph Add command. Then customize the graph by changing its color and that of the graph's background. To change the graph's color, use /Graph Edit Color Map; choose a number between 1 and 8 to toggle among color schemes. To change the graph's background color, use /Graph Edit Color. Specify the graph by pointing to or entering the cells.

### TIP #4 Lotus 1-2-3 Release 4 for DOS: Maximum Worksheet Memory

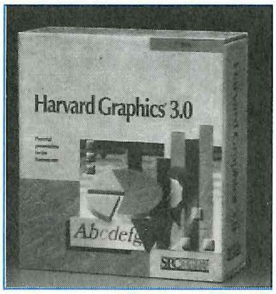
As your Lotus 1-2-3 worksheets get bigger and you make more changes, you often end up with cells containing unnecessary data or formatting. Such files use much more storage space than they should—a problem if your hard disk doesn't have huge amounts of room left. To make your worksheets lean and mean, use End Home to move the cell pointer to the bottom-right corner of the active screen.

If the active area is larger than you expect, your worksheet probably contains unnecessary or unintended entries or formatting. To remove them, follow these steps:

1. Use /Range Erase to remove data you don't need.
2. Use /Range Format Reset to remove formatting you don't want.
3. Use /Worksheet Delete Column or /Worksheet Delete Row to remove entire columns and rows of unnecessary data or formatting.
4. If cells in several areas of your worksheet contain unnecessary data or formatting, use /File Xtract Formulas to create a new file containing only the entries you want.

### TIP #5

### Harvard Graphics for DOS: Speedier Redraw



Turn off the Status window in Harvard Graphics 3.05 to reduce the time it takes to redraw the screen. To do that, press F8 from the Draw screen for Options, move to Redraw Options, tab down to the Show Status Box field, and set it to No.

### TIP #6

### Harvard Graphics for DOS: Importing Lotus and Excel Files

To import data from Lotus 1-2-3 3.0 or Excel 3.0 or 4.0 into Harvard Graphics, you need HG's version 3.05 or later. With earlier versions of Harvard Graphics, save your spreadsheet in WK1 format and import the WK1 file.

### TIP #7

### Harvard Graphics 3.0 for DOS: Custom Colors

Harvard Graphics' hardware palettes are designed for screen use, but if you use them for output, the colors won't match what you see on screen. For outputting those colors, use a chart or custom palette. To see your color changes, move the pointer to the chart area and press Enter or click the left mouse button.

### TIP #8

### Harvard Graphics for DOS: Presentation Previews

You don't need to output all your presentation's charts in Harvard Graphics only to find that you have to go back and make all kinds of changes. Preview your charts on screen first, and you'll save lots of paper, time, and frustration:

1. Select Output from the main menu, then Presentation.
2. Select the appropriate output device.
3. In the Output Presentation pop-up for your device, set the options you want. Press the F2 key to preview the first chart; then press F10 to preview each subsequent chart.

### TIP #9

### The Norton Utilities 8.0 for DOS: Floppy Revival

Have you ever tried to use a floppy disk and gotten a message such as "General failure error," "Sector not found error," "Read fault error," or "Seek error"? That means there's a problem with the floppy disk's data. The Norton Utilities' Disk Tools function can build new physical-format information.

But unlike DOS formats, Norton formats leave the original data still accessible. Note that this procedure can make a defective floppy disk usable again, but you may still lose data from damaged areas of the disk:

1. At the DOS prompt, type `DISKTOOL` and press Enter.
2. Choose "Revive a Defective Diskette" from the menu and follow the on-screen directions.

### TIP #10

### The Norton Utilities 8.0 for DOS: Permanent Control Settings

The Norton Utilities' Control Center module lets you customize a wide variety of system settings—everything from cursor size to video mode to keyboard and mouse speeds—for maximum computing comfort.

There's just one hitch: Unless you save all your settings in a special file and insert them into your AUTOEXEC.BAT file, you'll lose them whenever you reboot your PC. Follow these four steps in sequence to make your chosen system settings permanent:

1. At the DOS prompt, type `NCC` and press Enter.
2. Customize settings to your preferences and choose Save Settings from the File menu.
3. Enter a filename (include the path) for your system settings.
4. Edit your DOS's AUTOEXEC.BAT file to include the following line:

```
NCC C:\NU\SETTINGS.DAT /SET
```

Note that \NU is the subdirectory containing your Norton Utilities 8.0 files. SETTINGS.DAT is the name you gave to the Control Center file in which you saved your designated system settings.

## TIP #11

### The Norton Utilities 8.0 for DOS: Fleet Keyboard Response

One of the handiest features of The Norton Utilities is the Control Center's keyboard-speed setting. It manages both the number of characters to repeat per second when you hold down a key and the delay before the character starts repeating. You can edit faster with a speedy keyboard simply because you can move the cursor around the screen faster. To set the quickest repeat rate and the shortest delay, add the command `NCC /FAST` to your AUTOEXEC.BAT file.

## TIP #12

### The Norton Utilities 8.0 for DOS: Making SmartCan Smarter

The Norton Utilities' SmartCan can prevent data loss by temporarily holding files you erase in a directory. By default, SmartCan saves all erased files, but if your disk space is limited, you might want to protect only certain types of files.

For example, many applications create and automatically destoy files with the extensions TMP, SWP, and INI. You also might want to exclude EXE, COM, and SYS files because you can restore them from original program disks. Follow these steps to customize SmartCan:

**1.** From the DOS prompt, type `SMARTCAN` and press Enter.
**2.** Check the "Enable SmartCan" option in the SmartCan dialog box.
**3.** Choose which files to protect:

- All Files protects every deleted file.
- Only the Files Listed protects just files with the extensions you specify in the File Extensions box.
- All Files Except Those Listed protects all files except those with the extensions you specify in the File Extensions box.
- Protect Archived (Backed Up) Files protects files a backup program has marked as archived. By default, SmartCan doesn't protect archived files because you can restore them from your backup disks.

## TIP #13

### The Norton Commander: Convenient DOS Commands

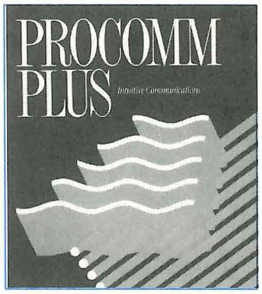
One of the problems with most DOS shells is that they replace DOS entirely, without leaving you the option of typing DOS commands. At the very least, that's quite an inconvenience.

Not so with The Norton Commander. Under its panels, it leaves a command line that looks like a regular C:\ prompt. To input a DOS command, you simply type it at any time and press the Enter key. This move is especially useful when you're running programs that aren't in your current direcotry, but are in the directory's path.

## TIP #14

### Procomm Plus for DOS: Quick-Change Artist

One of Procomm's strong points is its extensive selection of setup options. (Press Alt+S from the Terminal screen.) Moving through multiple levels of menus is frustrating, though, if you just want to make a quick change to a single option. There's an easier way. Once you've changed an option, just press F10; that automatically saves your changes and exits Setup.



## TIP #15

### Quicken for DOS: With Tax Time in Mind

If you're using Quicken to track both business and personal expenses, and you write a check or use a credit card covering both business and personal expenses in a single transaction, make sure you enter the two amounts separately via Quicken's Split Transaction option.

What's the payoff? This little trick will ensure that Quicken will track and report expenses correctly when you prepare your taxes next year.

## TIP #16

### Quicken for DOS: High Security

The more data you enter into Quicken, the more important it is to protect previously entered data from inadvertent changes. Because so much of your spreadsheet data is interconnected and interdependent, one slight error can have a magnified effect.

Fortunately, you can use passwords in Quicken to protect a transaction within a certain date range from changes. Once you set it up, you can't make changes without entering the password. Just follow these steps:

**1.** From the main menu, choose Set Preferences/Password Settings/Transaction Password.
**2.** Enter the password you want to use.
**3.** Enter the date through which the password will be required for editing access.
**4.** Enter the password again to confirm it.

Note that you can make all your Quicken data files "read only" by entering the date `12/31/99`. You can then look at your data, print it, and even create data reports, but you can't change any data without entering the password.

An important reminder: *Don't forget your password.* If you do, the only way to get it back is to send your file to Intuit's own Password Removal Team, which requires a service fee.

*Continued on page 20*

## TIP #17

### Quicken for DOS: Backup Reminders

Backing up your financial data is an absolutely crucial part of using Quicken. Here's how to set up reminders to back up at regular intervals:

**1.** Make sure that the file you want to back up is the current file.
**2.** From the main menu, choose File Activities/Set Backup Frequency.
**3.** Select a frequency from the menu and press Enter.

If you don't back up after the period of time you've selected, Quicken will display a reminder menu and give you the option of performing a backup immediately by inserting a backup disk.

## TIP #18

### Quicken for DOS: Adding Categories

If you set up Quicken without either a standard Home or Business category and your situation changes later, you can add categories in the future. Follow these steps:

**1.** Make sure the file to which you want to add standard categories is the current file. If not, use Select/Set Up File to change it.
**2.** In the Write Checks or Register window, choose Import from the Print/Acct menu.
**3.** Enter `HOME.QIF` or `BUSINESS.QIF` as the filename.
**4.** Press Enter to begin importing.

## TIP #19

### Stacker 4.0 for DOS: Compress Those Floppies

If you use Stacker regularly to create compressed floppy disks, AutoMount your PC's floppy-disk drives to make them permanently Stacker-aware. The drive will then recognize Stacker disks whenever you insert them. AutoMount doesn't affect the way your floppy-disk drives handle standard, noncompressed floppies. Use either your own ASCII editor or ED, the editor included with Stacker. Here's how to do it with ED:

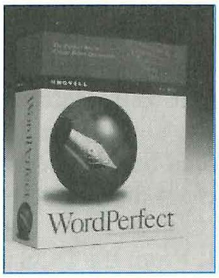
**1.** Change to the drive and subdirectory where the Stacker files are located (usually C:\STACKER).
**2.** Type `ED` to open the Stacker editor.
**3.** Choose STACKER.INI from the File menu.
**4.** Move the cursor to the end of the file and press Enter to create a new line.
**5.** Type `A:` to make your A drive Stacker-aware.
**6.** If you have a drive B and want to make it Stacker-aware, enter `B:` on a separate line.
**7.** Press Ctrl+Z and then the Enter key to exit ED and save the changes.
**8.** Reboot your computer to put the changes into effect.

## TIP #20

### Stacker 4.0 for DOS: Setting Drive Letters

When you install Stacker, it usally assigns the next-available drive letter to the compressed Stacker drive. That can create problems under certain circumstances: if your drive (such as a CD-ROM drive) requires a certain drive letter, for example. Here's how to specify the drive letter Stacker will use:

**1.** Change to the directory containing the Stacker files.
**2.** Type `ED` to open the Stacker editor.
**3.** Choose STACKER.INI from the File menu.
**4.** At the top of the file where the commands are listed, press Enter to insert a new line.
**5.** Type `/BD=(drive letter)`, where the drive letter is the first you want to assign to the Stacker drives.
**6.** Press Ctrl+Z, then Enter, to exit ED and save the changes.
**7.** Reboot your PC.



## TIP #21

### WordPerfect 6.0 for DOS: Select Text Fast

When using your mouse to select blocks of text, click twice to select a word; three times for a sentence; four times for a paragraph.

## TIP #22

### WordPerfect 6.0 for DOS: Instant Thesaurus Access

To access the Thesaurus dialog box, place the cursor on a word and press Alt+F1, 2. Don't select the word as a block, however, or you won't access the Thesaurus. If you want to check a single word, put the cursor on it and press Alt+F1, 1.

## TIP #23

### WordPerfect 6.0 for DOS: Clean Up Your Button Bar

To simplify your WordPerfect button bar, you may want to delete some buttons you never use. First, with the button bar displayed, select View, then Button Bar Setup, and then Edit.

The Edit Button Bar dialog box will appear; select the button you want to delete. Then just click on the Delete Button command.

## TIP #24

### WordPerfect 6.0 for DOS: Viewing Thumbnails

Especially handy for multipage desktop-publishing work is WordPerfect's thumbnail-view mode. Access it from the File menu; select Print Preview. Select View/Thumbnail and the number of pages you want to see at once on one screen. ■

SHAREWARE EXCHANGE

# Shining Stars On the Net

by Hardin Brothers

We receive a vast range of shareware nominations for this column, proof that you can find almost any program type and size if you're willing to look for it. Where should you start? Here, of course, where readers share their favorite programs. If you find one you like, you can download it from the DOS World BBS (603-924-3181; see "Share the Wealth," page 22, and the "BBS" section of "How to Use This Magazine," page 64 in this issue, for instructions). Your local BBS is another good source. Some computer stores carry shareware for $4 a disk or so, and you can order from commercial shareware distributors such as the Public Software Library (713-524-6394; orders 800-242-4775).

*Something small, something large; something simple, something complex. You can find it all on the World Wide Web, home of some of the best shareware anywhere.*

But by far the largest collection of shareware is on the Internet. If you have access to the World Wide Web, point your browser to **http://www.acs.oakland.edu/cgi-bin/shase**; the SHASE program at this address can search through more than a dozen file libraries based on operating system, name, age, size, and description. Once you find the files you're looking for, a few mouse clicks or keystrokes will download it for you.

## Batch Files and Mice

We'll start with the simplest program and work up to the most complex. The first nomination comes from Jeremy Campbell of Kansas City, Missouri:

*I wouldn't even think of creating batch files that use the mouse without **BATMouse**. It's a great program that adds mouse support easily to any batch file.*

BATMouse is both simple and elegant. If you want mouse input in a batch file, you add a single line: `BATMOUSE`. A text-based mouse cursor appears, which you can move anywhere on screen. When you click the mouse button, the cursor disappears and BATMouse creates a pair of zero-byte files: MCOORDX.*NN* (with *NN* representing the column location of the mouse when you clicked the button) and MCOORDY.*NN* (with *NN* representing the row location). Your batch file can then test the location of the mouse click with IF...EXIST commands.

I can see only one drawback to this program: While BATMouse is waiting for a mouse click, the keyboard is disabled. That means you have to use the mouse to make a selection. Otherwise, it's a neat and simple little program.

## A Basic Address Book

The next small and simple program this month is nominated by Terry Vaughan of Lewiston, Idaho:

***Namebase** is absolutely the best address-book program I've found. It lets you code names for later separation, and prints labels easily. There's no confusing set-up procedure, and the author is quick to respond to questions and problems.*

Namebase version 3.2 is a nifty little program, and it really is simple to use. For each person in the address book, the program has room for a first and last name, title or honorific (Mr., Ms., and so on), an ID field, four phone numbers and two addresses, a code field, and a note field holding as many as 30,000

## SHARE THE WEALTH

Our "Shareware Exchange" column invites you to send a copy of your favorite shareware program, along with a description and an explanation of why you like it (no more than 500 words) to Shareware Editor, *DOS World*, 86 Elm St., Peterborough, NH 03458. Tell us how we can obtain a copy of the program. We'll pay contributors $50 for each program featured here. Please don't send us shareware you've written yourself—we prefer recommendations from users, not authors.

Contact us on CompuServe at **75300,2361** or on the *DOS World* BBS at **603-924-3181**. All programs featured in "Shareware Exchange" are available by modem from the *DOS World* BBS (instructions on page 64). Namebase (NAME32.ZIP) is in File Area 2. BATMouse (BMOUSE10.ZIP) and PocketD Plus (POCK44.ZIP) are in File Area 5. In addition, most of the programs described in "Shareware Exchange" can be found on major on-line services and local BBSes.

**—Eds.**

characters. In a single data file, the program can store as many as 200 subfiles (distinct lists of names and addresses); each subfile can contain as many as 3400 names. It can print labels, envelopes, address books, and Rolodex-type cards, as well as dial the phone for you. Namebase can also export data in a form that other database programs can read.

Namebase presents an attractive screen and is so easy to use you probably won't need the program's on-line help. If you don't already have one of those complex, do-everything PIMs (personal-information managers), consider Namebase. It offers just enough features to make it truly useful without being difficult to learn.

### All That Power

The final nomination, from Jacques Jangoux of Belém, Pará, Brazil, is a sophisticated file manager:

***PocketD Plus** lets you perform innumerable operations on files and directories, some of them quite elaborate. It's very useful—although it can be somewhat complex. But its MenuD interface helps by letting you select options and build custom command lines. It displays a clear description of the operation you're performing, no matter how involved.*

PocketD Plus 4.4 is an amazing program. It's very small—it takes up less than 32K of disk space plus another 55K for its primary help files—but in that space, PocketD offers more than 200 options. In essence, it's a color directory program, displaying each type of file in a different hue. But it's one of the most powerful file managers available for any system. It can select files by name, content, size, and date; support advanced wildcards; display filenames in a variety of formats; and apply a template to each file found (something like a one-line batch file).

All this power resides in command-line switches, so PocketD can be difficult to understand. But its companion program, MenuD, overcomes much of the potential confusion. MenuD lets you build PocketD commands from a series of pull-down menus. It divides PocketD's capabilities into three menus: Where to Look, What to Look For, and What to Do. Each menu contains several choices and submenus. While you select options, MenuD displays the resulting PocketD commands on screen, along with clear explanations of their functions.

I expected that much from MenuD—but I didn't expect it to be able to write batch files for me. Once you've used MenuD's menus to create a complex command line, you can test it by running it within the MenuD program. When you're satisfied, save the line to use later, or tell MenuD to write a batch file based on the line. The batch file it creates is fully commented, telling you exactly what it does and how. Used this way, MenuD is an automatic utility generator.

As longtime *DOS World* readers know, I'm a great fan of JP Software's 4DOS, because it's much more versatile than traditional DOS commands. PocketD is another leap forward in power, making it a great companion to 4DOS and an exceptional addition to any DOS machine. Unless your computing needs are very modest, you owe it to yourself to try PocketD. You'll wonder how you got along without it. ■

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*Technical Editor Hardin Brothers has been working with computers and writing about them for 15 years.*

### PRODUCT INFORMATION

**BATMouse 1.0, $10 plus $3 shipping**
Batson Enterprises
4521 Fenwick Way
North Highlands, CA 95660

**NameBase 3.2, $25 plus $4 shipping**
Michael Paulick
P.O. BOX 935
Conifer, CO 80433-0935

**PockedD Plus 4.4, $49**
**plus $4 shipping**
PocketWare
P.O. Box 2369
Hendon
London NW4 1NR
England

DIAGNOSING SYSTEM AILMENTS

# The Case of the Sick PC

*Why does one of your files contain data from another? And why is your modem suddenly giving you attitude? Sometimes it takes a little detective work to figure out why your system is acting up.*

by Ken Johnson

System glitches range from the benign (a loose connection) to the bizarre (cross-linked files) to the extremely irritating (your backups won't restore your files). And while we all know they're inevitable, we're still surprised when they happen to us.

Most of these annoyances, however, are fixable. In fact, your computer is probably giving you the clues you need to decipher the problem. Using the guidelines below, take these (with any luck) rare opportunities to become your own system sleuth.

## The Hard Drive That Wouldn't Boot

Frequently, boot problems are caused by loss of the CMOS information, corruption of the master boot record (which contains information about the hard drive and the location of your disk partitions), and misbehaving software (particular TSRs).

If your system won't boot up, follow these suggestions to identify, and with any luck then resolve, the problem:

### ■ Your computer may be trying to tell you what's wrong.

When you turn it on, the PC goes through a power-on self-test (POST). If the POST finds errors, the speaker emits an unusual beep (different from the standard one you normally hear when the eystem starts) and displays a code number on screen (sometimes with a brief message). In general, 100s means system-board problems, 200s memory, 300s keyboard, 600s disk drives, 700s coprocessor, 900s through 1200s serial and parallel ports, and 400s, 500s, 2400s, or 2500s the video adapter. Or you may see a "Parity Check" error message, indicating faulty memory chips. These messages help identify the source of the problem. Sometimes the remedy is as easy as securing a loose keyboard connection—or it could mean something worse.

### ■ Do you see a "Battery Failure" or "CMOS Failure" message telling you to run Setup?

CMOS is special battery-powered memory that holds configuration data. If and when the battery dies, you'll need to replace it and respecify the CMOS settings. Even if the battery is good, corruption in the CMOS memory may require you to reset the configuration data. Run the PC's Setup program, usually by pressing Ctrl+Alt+Esc at the command line or by pressing Esc while the PC is booting. (For more on CMOS, read "Without You I'm Nothing," by Hardin Brothers, in *DOS World* #21, May 1995, page 28.)

### ■ If the POST encounters no problems, the PC tries to boot.

It tries drive A first, then drive C. When the boot fails, the disk makes a brief noise; then an error message appears. This sequence will usually be the first indication that you've got a problem with the hard-disk drive.

---

*Contributing Editor Ken Johnson is training and support manager at the law firm of Mayer, Brown & Platt in Chicago. He's a columnist and writer for several business and computer-law publications and is a contributing editor for the American Bar Association's* NETWORK 2d *newsletter. He also serves as a technical associate for CompuServe's Windows Utilities (*WINUTIL*) forum.*

■ **You may have a video or monitor problem if the computer sounds as if it's running properly but nothing appears on screen.**
Check that the monitor is plugged in and connected securely to the PC. Check the brightness and contrast controls. The POST will beep if it encounters a video problem, but it has no way to check the monitor. If there's no beep, borrow another monitor and try it.

■ **Misbehaving device drivers and TSRs can freeze the start-up process.**
If you have MS-DOS 6.x, do a clean boot by pressing F5 when you see the "Starting MS-DOS" message, or boot from the floppy drive. Comment out all drivers and TSRs in CONFIG.SYS and AUTOEXEC.BAT, and reboot. If that's successful, add back one item at a time and reboot to identify which program is causing the problem.

■ **If drive C fails to boot, check to see whether the drive is accessible at all.**
Boot from drive A and change to C. If you can see files, then the problem is in the booting program. Run ScanDisk or another disk-repair program to fix the boot record.

■ **The message "Invalid Drive Specification" while you're trying to go to drive C signals more possible problems.**
Reboot and run your Setup program, and make sure that the drive settings for C are correct. If you have special disk-partitioning software, confirm that the driver program hasn't been deleted and is loading correctly in CONFIG.SYS. Otherwise, the master boot record might be corrupt. Run ScanDisk or a similar program to repair it. As a last resort, you could also try running FDISK with the /MBR switch, which replaces the master boot record with a clean copy.

■ **If all this fails, you may have a problem in the circuit boards.**
Unless you know a lot about system components and feel comfortable swapping them, take the PC in for repair.

### The X-Linked Files

If you have a file that seems to contain data from another file (or garbage characters), it may be *cross-linked*: Two files may be pointing to the same clusters on disk. DOS uses allocation chains to link the clusters belonging to each file. When files are cross-linked, a file starts with its own clusters, then shifts to the clusters of another file. Its own ending clusters are "lost"—disconnected from any allocation chain.

If you suspect cross-linkage, close the application immediately without saving the file. You might also discover cross-linked files during routine disk checking with ScanDisk or CHKDSK. With cross-linked files, one file will usually be intact. Part of the other file, depending on its type, may be recoverable in some useful form.

If you have MS-DOS 6.2 and suspect cross-linked files, run ScanDisk. Make a note of the filenames, because you'll have to examine them later to see which is intact and whether you can salvage data from the bad one. ScanDisk also converts lost clusters ("lost allocation chains") to files; it places them in the root directory and names them FILE0000.CHK, FILE0001.CHK, and so on.

If you don't have MS-DOS 6.2, you can use CHKDSK to help recover cross-linked files. CHKDSK can't fix cross-linked files, but it can identify those files and convert lost allocation units to files. First, run CHKDSK to identify the names of the cross-linked files. Then make copies of the two files under different names. (DOS should be able to copy both files, even though they're cross-linked.) Then delete the two original files. This fixes the allocation chains in the file-allocation table. Finally, run CHKDSK /F to convert the lost clusters to files.

Note that if you're using DOS's UNDELETE with the Delete Sentry option, unload its TSR portion before trying to erase the cross-linked files (UNDELETE /UNLOAD). Delete Sentry will prevent you from deleting cross-linked files.

If either of the two files is an executable program, restore it from the original program disk or from a backup. Running a cross-linked program file could damage your disk or cause other serious problems. Remember that one file will be corrupted, but the other may not

QBasic TIP

## PLAYING QBASIC'S SHELL GAME

Most applications let you go out, or *shell*, to DOS temporarily, do something, and return to the application in which you were working. Strangely, QBasic doesn't provide this as a menu option, but you can do it easily. Simply press F6 to switch to the Immediate window (or move the mouse pointer to the bottom of the screen and click once), type `SHELL`, and press Enter. You'll find yourself at the DOS prompt. To return to QBasic, type `EXIT`, and press Enter twice.

Because QBasic saves everything typed in the Immediate window, shelling to DOS a second time is even easier—press F6 (or click on the Immediate window), move the cursor to the line containing SHELL, and press Enter.

If you want to know the time when you shell to DOS, type `SHELL "ECHO. | TIME"` in the Immediate window. Placing both a SHELL command and a SHELL "ECHO. | TIME" command in your Immediate window gives you greater flexibility. Select either command by positioning the cursor on it and pressing Enter.

—Richard Penn

be intact either. To avoid the risk, restore or reinstall both files. Then delete the FILE0000.CHK files from the root directory.

If the cross-linked files are data, you can probably recover part of the corrupted file. Bring each of the two files into the application that created it. This will let you identify which file is intact and which is damaged. For the damaged file, move through the file until you see the start of the damage, then delete everything to the end of the file.

Depending on the type of file—text files offer the best chance—you may be able to "graft on" the end of the damaged file. Remember that the data in the bad file after the cross-link is in the form of lost clusters, which CHKDSK /F converts to files. After deleting the damaged end of the bad file, try retrieving the FILE0000.CHK. You may get back part of the original end of the file in a usable form.

### Backup Lock-Up

Okay, so you had a computer crisis and lost some data; at least you can turn to your backup disks. But what if you try to restore files and discover that your backup disks have gone bad?

First, if you're using Microsoft Backup for DOS (MSBACKUP.EXE), you may encounter problems using the Restore function that aren't the result of bad backup disks. In particular, Microsoft doesn't recommend or support running MSBACKUP from Windows. Problems may also occur if you try to run MSBACKUP.EXE from a third-party menu program. In both cases, exit back to the DOS prompt and run MSBACKUP from there.

MSBACKUP may also fail to restore files to your PC if that's not the system on which you backed them up originally. Attempting to restore files in that case may result in the error message "Cannot read volume information from diskette" or "Cannot determine diskette type."

In these circumstances, you'll need to rebuild the backup catalog file before you can restore files. From the Catalog menu, choose Rebuild, then select the drive containing the backup disks. (The catalog is on the last disk of the backup.) After rebuilding, load the catalog and continue restoring.

If you do indeed have bad backup disks, you can probably restore files from the undamaged part of the disk(s). MSBACKUP will work around a defective area on a backup disk if you used error-correction codes during the backup, specified in the Options dialog box. MSBACKUP writes special error-correction codes on the backup disks; that helps Restore recover backup data even if the disk is damaged.

If you're repairing a pre-DOS 6.0 backup with the RESTORE command, you can fix the remaining disks after the damaged one. When you encounter the bad disk, press Ctrl+C to exit RESTORE. Insert the next disk in the sequence and reexecute RESTORE. You'll receive the message "WARNING! Diskette is out of sequence. Replace diskette or continue if OK." Press any key, and the restoration will continue from that disk onward.

To avoid potential restoration problems, run your backups with Verify turned on. (In MSBACKUP, it's in the Options dialog box.) Verifying adds considerable time to your backup, but it ensures a perfect result. With Verify, MSBACKUP rereads each backup file and compares it with the original on the hard drive; it can then correct errors immediately. If a disk is bad, MSBACKUP will try several times to write the file; if it's unsuccessful, MSBACKUP will prompt you to change disks so that the backup can continue.

### The Misbehaving Peripheral

Tracking down peripheral failure—video, monitors, modems, sound cards, scanners—should always start with making sure that the peripheral is plugged in and connected securely to the PC. Second, make sure that any device drivers or programs the peripheral requires are loaded in CONFIG.SYS and AUTOEXEC.BAT. Watch closely the messages when booting; putting PAUSEs in AUTOEXEC.BAT lets you examine messages before they scroll by.

Problems with certain peripherals, such as sound cards and scanners, may be a result of upper-memory conflicts, when DOS or another program writes to memory the peripheral is using. Check your peripheral's documentation to determine which memory address the card uses, and boot up without the peripheral and its drivers to see whether that memory is in use. If so, exclude those ranges in the memory manager's line in CONFIG.SYS. With EMM386.EXE, use the /X= switch.

Trace video problems back to the video card or the monitor. All PCs write messages to the screen when booting; you know the video system is working okay if you see any intelligible message displayed. If not, adjust the monitor's brightness and contrast. Still nothing? Borrow another monitor and try it.

If the screen's still blank, the problem is probably the video card. (The POST will let out an odd repetitive beep if it encounters problems in the card. If you don't hear such a beep, it's probably the monitor.)

When troubleshooting peripherals or other hardware, turn off the PC rather than doing a Ctrl+Alt+Del reboot or pressing the Reset switch. A warm boot or cold boot may not reset all the adapters on the peripheral's card. Turn off the PC and leave it off for about ten seconds. That lets the motherboard discharge completely, the hard disk stop spinning, and the peripheral cards reset.

### Learn to Look for Clues

You don't need a bloodhound to help solve your PC problems. Pay attention to the signs and signals your computer gives you and you just might crack the case all on your own. ■

HARD-DISK CLEANUP

# Rev Up Your Hard Disk With Defrag

*Fragmented files are a speed drag on any PC. Simple and safe (and free!), DOS's Defrag utility cleans up your disk and gets you back on track in no time.*

by Tony Roberts

Consider your kitchen floor. In the course of preparing and eating meals, crumbs are often scattered all over it. Now, you could let the crumbs build up until you had a nasty, vermin-infested kitchen—not a particularly pleasant or efficient place to cook. Or you could mop the floor every now and then.

Similarly, pieces of the files on your computer become scattered about your hard disk over time. Consequently, your system becomes sluggish and you notice increased difficulty recovering accidentally deleted files. Although file fragmentation is inevitable, it's easily corrected with one of the many defragmentation utilities on the market, or with MS-DOS 6.x's own Defrag utility.

### How the Mess Gets Started

To understand how file fragmentation occurs, it helps to know what's going on inside a PC when files are stored. When you format a disk, DOS's formatting software lays out a series of concentric rings, called *tracks*, on the disk. Tracks are broken into *sectors*, each of which holds 512 bytes of data. Formatting software also adds a *file-allocation table* (FAT) to the disk. The FAT is your road map to everything stored on the disk.

Although the disk is marked off into 512-byte sectors, DOS prefers to store files in larger units of space, called *clusters*. The size of a cluster depends on the size of your disk drive. Typical floppy disks use 1K clusters. Small hard drives use clusters of 2K or 4K, and larger drives typically store files in 8K clusters.

To determine which size your system uses, run the DOS utility CHKDSK on your hard drive. The second group of data in the display includes a line that reads something like "8192 bytes in each allocation unit," indicating that the disk uses 8K clusters.

On a newly formatted disk, files are placed one after another starting at the outside, or beginning, of the disk, directly after the boot record, the FAT, and the root directory. As each file is stored, DOS

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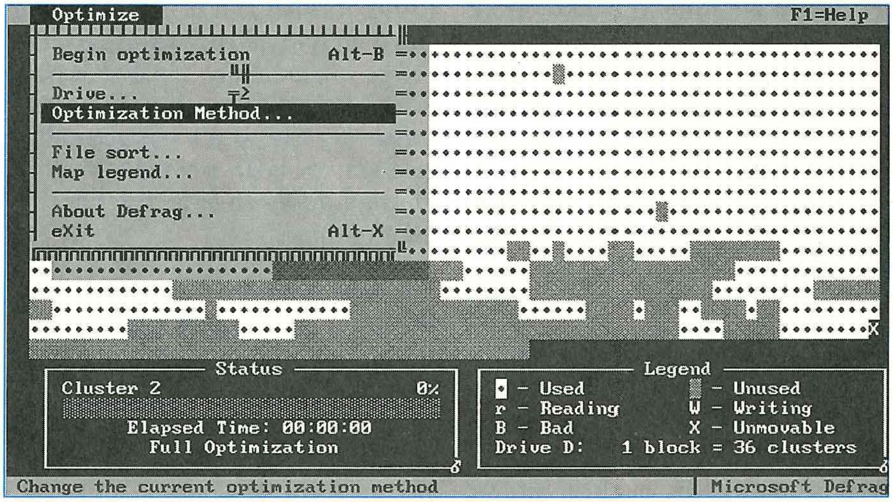


```
Status
Cluster 2                          0%
       Elapsed Time: 00:00:00
         Full Optimization

Legend
• - Used              ▒ - Unused
r - Reading           W - Writing
B - Bad               X - Unmovable
Drive D:    1 block = 36 clusters

Change the current optimization method    | Microsoft Defrag
```

**Although MS-DOS 6.x's Defrag utility is simple and slow, it's a no-frills way to get the job done.**

makes an entry for it in either the root directory or a subdirectory. This entry includes the usual things you see in a directory display: filename, attributes, file length, date, and time. In addition, one entry points to the file's starting cluster number.

In the FAT, you'll find a series of spaces, one for each cluster on the disk. These spaces are chained together to tell the operating system where all the parts of a file are located.

For example, if a file's starting sector number is 30, DOS looks in pigeonhole 30 to see what's stored there. If it finds number 31 there, then the first two clusters of the file are contiguous—or right next to each other in clusters 30 and 31. Then DOS checks number 31 to find the next piece of the file. This process continues, with DOS following the pointers and picking up each succeeding part of the file until it finds the end.

When files are placed on a newly formatted disk, they go one right after another, and the resulting file chains in the FAT show that files are stored cluster after cluster on disk. Things begin to change, however, the first time you delete a file.

At this point, DOS doesn't do anything physically to the data in the file. Instead, it changes the first character of the filename to a special character identifying the file as deleted, and it zeros out the cluster chain for the file in the FAT. These changes tell DOS that the space once occupied by that file is now available for reuse.

Let's say you delete a tiny, one-cluster file. The next time you store a file—any file of any size—DOS will usually find the first empty spot on the disk to fill it. In this case, it will put the first cluster of the file you're storing in the spot recently vacated by the deleted file. Then DOS seeks out the next vacant spot on the disk and continues storing the file there. Congratulations—you now have your first fragmented file.

DOS doesn't have any trouble finding the file when you need it; it simply refers to the cluster chain in the FAT and uses that information to reassemble the file. It takes a fraction of a second longer to retrieve the file, though, because instead of being able to read all the clusters sequentially from the disk, DOS has to move the drive's read head from the track with the first cluster to the tracks where subsequent clusters are stored.

A single fragmented file isn't much to worry about, but over months or years, fragmentation can become significant enough to bog down your system during file reading and writing. As fragmentation worsens, it also becomes more difficult to use the UNDELETE command to rescue accidentally deleted files. (See "Bringing Back the Dear Deleted," below.) Now you have two reasons—performance and safety—to undo fragmentation.

### A Jolt of Defrag Restores Order

Several years ago, when hard drives were a relatively new invention, defragmenting a drive required

## BRINGING BACK THE DEAR DELETED

One good reason to keep your disks defragmented is that accidentally deleted files are easier to recover with DOS's UNDELETE command (found in DOS 5 and later).

When you delete a file, DOS makes changes to that file's directory entry. First, the initial letter of the filename is changed to a special character signifying that the file has been deleted, and second, the cluster chain describing where the file is stored on disk is zeroed out. Other information pertaining to that file is left intact, however, including the file's length, its starting sector, and the actual data stored on disk.

When you attempt to recover a deleted file, DOS uses the starting sector and file-length information to determine whether it has a chance to save the file. If another file hasn't overwritten the starting sector, DOS tries to assemble the remainder of the deleted file by collecting vacant clusters until it reaches the amount of data matching the indicated file length.

If the deleted file is contiguous (not fragmented), UNDELETE is often successful in making the recovery. But if parts of the deleted file are scattered across the disk—a cluster here and a cluster there—DOS can't be certain that all the clusters it adds were actually part of the original file.

Note that the scenario mentioned above is based on situations in which no delete protection is in effect. File fragmentation has no effect on file-recovery probabilities when using DOS's Delete Tracker or Delete Sentry options (found in versions 6.x and later). Under the Delete Tracker option, DOS keeps a record of the cluster chain of deleted files; if the deleted file's clusters haven't been overwritten, you can recover the file accurately. Delete Sentry actually keeps hidden copies of deleted files on hand, just in case. Running Defrag, in turn, doesn't alter the ability of these two programs to recover lost files.

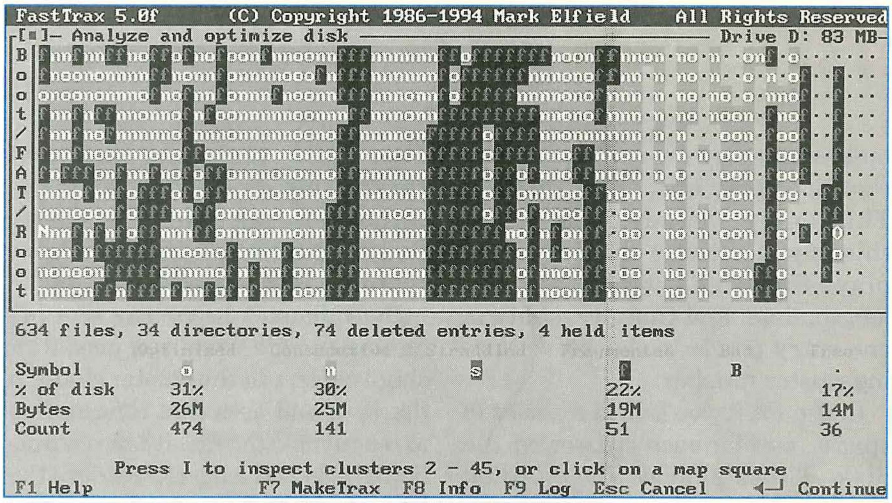
You should consider installing one of these delete-protection options if accidentally deleted files are a concern.

**—T.R.**

backing up all the files to floppies, erasing everything from the hard drive, then restoring all the files from the floppies. Not a lot of fun!

Today, however, simple defragmentation utilities are readily available. They work by moving files around the disk until all files are contiguous. In a way, they're sort of a high-tech version of those sliding number puzzles we used to take on long car rides.

Users of DOS 6.0 and later can find a good defragmentation utility, **Defrag**, right in their \DOS directories. It's relatively safe and easy to use. Just type `DEFRAG` *`drivename`* at the command line.



```
FastTrax 5.0f      (C) Copyright 1986-1994 Mark Elfield      All Rights Reserved
[■]— Analyze and optimize disk                                    Drive D: 83 MB
634 files, 34 directories, 74 deleted entries, 4 held items

Symbol        o          n          s          ▌          B          .
% of disk     31%        30%                   22%                   17%
Bytes         26M        25M                   19M                   14M
Count         474        141                   51                    36

             Press I to inspect clusters 2 - 45, or click on a map square
F1 Help                 F7 MakeTrax  F8 Info  F9 Log  Esc Cancel    ↵ Continue
```

**FastTrax 5.0 takes simple disk defragmentation a step further, improving system performance and letting you customize the process with schedules and worksheets.**

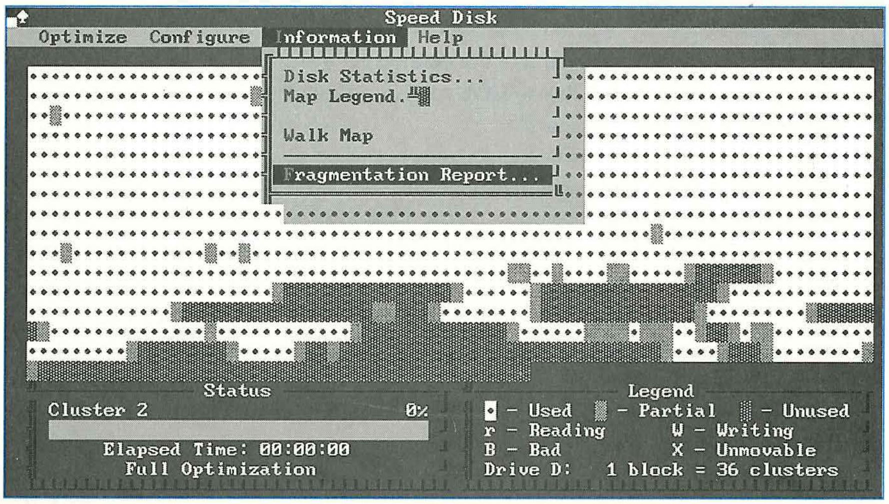
The program assesses the condition of your disk and recommends whether to perform a full disk optimization or just a simple defragmentation. Full optimization takes longer, but it moves all your files to the front of the disk, near the FAT, and collects all the free space at the back. A simple defragmentation, though faster, leaves your disk peppered with vacant clusters.

During defragmentation, Defrag rearranges your files and constantly rewrites the FAT to reflect the changes. Defrag and other, commercial defragmentation programs can generally withstand even power outages without scrambling your data—unless the outage happens to occur at the instant it's making changes to the FAT. Most programs let you interrupt a partially completed process if you need to put your machine back into service.

The first time you defragment your disk, you'll sit and watch as the program constantly updates the disk map displayed on screen. It's fascinating to see files move forward and free space collect at the back. After you've seen the process a few times, though, you'll want to automate it and spend those precious minutes doing something more productive. (See "Do-It-Yourself Defrag," page 29.)

DOS's Defrag also comes with several handy command-line switches that let you run the program without further intervention:

- /F carries out a full optimization, defragmenting all files and collecting all free space into one block.
- /U activates a quick file defragmentation, in which free space is left scattered across the drive.
- /B reboots your computer after defragmention is complete. You should always reboot after defragmenting a disk. After all, the FAT has been completely rewritten and files aren't where they used to be. If you had any kind of disk cache running, it may have become confused in the process. Safety dictates a system reset.
- /H lets Defrag move hidden files. By default, Defrag leaves hidden files alone, because many programs that use hidden files expect to find them in specific places. If you've set up a permanent swap file in Microsoft Windows, for example, the hidden swap file shouldn't be moved, or Windows won't be able to locate it.



```
Cluster 2                          0%
     Elapsed Time: 00:00:00
       Full Optimization

■ - Used    ▒ - Partial    ░ - Unused
r - Reading       W - Writing
B - Bad           X - Unmovable
Drive D:    1 block = 36 clusters
```

**Speed Disk 8.0, a component of The Norton Utilities, is a beefed-up version of DOS's Defrag utility, giving you more control over defragmentation options.**

Defrag also includes a switch that rewrites directories based on any sort order you choose: name, date, extension, size, and so forth. Because later versions of DOS now let you specify a sort order via the DIRCMD environment variable, it's not particularly useful to have Defrag sort the directories.

A special note: If you've compressed your disk drive, defragmenting may or may not provide a performance gain, depending on which program you're using. Early versions of disk-compression software don't support defragmentation. Check your program's documentation for details. If you have Stacker®, use the utilities provided with that program rather than standard DOS utilities.

### For Those Who Crave Power . . .

For most PC users, MS-DOS's Defrag is all you need. If you enjoy working with the best and fastest, though, other options are available.

**Speed Disk 8.0** (in The Norton Utilities 8.0, $99.95; Symantec Corporation, 175 West Broadway, Eugene, OR 97401; 800-441-7234) is a more powerful version of DOS's Defrag program. (Microsoft Corporation licensed a stripped-down version of Speed Disk from Symantec for inclusion in MS-DOS 6.x.)

Full-blown Speed Disk 8.0, a component of The Norton Utilities, is faster than Defrag and gives you more control over defragmentation options. For instance, Speed Disk lets you specify a list of files to place first on disk, and it lets you see which files are stored in any given disk location.

**FastTrax 5.0** ($70; FastTrax International, 880 Ensenada Avenue, Berkeley, CA 94707; 510-525-3510) is a power user's disk defragmenter. Not only is it fast, but it takes simple disk defragmentation a step further to give you a better-performing system.

In addition to making files contiguous, FastTrax attempts to reposition files so that they occupy the fewest number of tracks, thus cutting down on disk seeks. Also, FastTrax gives you control over which files to move and where to store them on disk. This lets you place the most frequently used files near the FAT, where your system can access them faster.

FastTrax also lets you create worksheets in which you can define a host of defragmentation options, including hold and place rules, sort instructions, and placement of free-space areas. Conditional worksheets let you specify that the program carry out instructions only if fragmentation has reached a certain level.

No matter which utility you use, you should notice an improvement in system performance during file reading and writing. Unfortunately, no sooner do you defragment than fragmentation begins anew. Users who create and delete significant numbers of files need to defragment more often than someone whose file structure is fairly stable.

How often should you fix your files? Run a defrag utility whenever you notice your system laboring over disk access. If it takes several seconds for your `C:` prompt to reappear after you exit Windows, your disk may need a cleanup. After running the defragmenter, however, you'll be amazed at how responsive your system has become. ■

## DO-IT-YOURSELF DEFRAG

Because today's hard drives are so large and store so many files, it's not unusual for DOS's Defrag to spend an hour or more on a full optimization and defragmentation. Because of this, most people tend to ignore the job. Who wants to tie up his or her machine when there's work to do?

The solution is to create an automated defragmentation process and to activate it once every week or two. Let the program run overnight or kick it off when you step away for lunch.

The first step is to create a batch file that includes the commands to defragment each of your hard disks or hard-disk partitions. Be sure to add the /B switch to the final command line in the batch file. Call the program DSKDFRAG.BAT to differentiate it from DOS's Defrag. Here's an example:

```
DEFRAG C: /F
DEFRAG D: /F /B
```

As you can see, I've used the /F switch to specify a full compression. That takes longer, but you'll be away while the computer's working, so what does it matter?

Defrag uses quite a bit of memory, especially as hard drives get larger and the number of files to process increases. To give it the best chance of working without interruption, clear out all your TSRs and network drivers before you begin.

The easiest way to do that is to perform a clean boot of your system. Press Ctrl+Alt+Del to reset it; when you see the "STARTING MS-DOS" message, press F5. This bypasses the CONFIG.SYS and AUTOEXEC.BAT files and lands you at the C: prompt.

Now, type `DSKDFRAG` to activate your batch program, and check out for lunch. When you return, Defrag should have completed its work, and your system will have rebooted itself and be ready for action.

If you've set up your CONFIG.SYS to display a boot-up menu, you might add a menu item with a Defrag option. Set up your CONFIG.SYS so that no unnecessary device drivers are added when you choose the Defrag option, and put the following line at the top of your AUTOEXEC.BAT file:

```
IF %CONFIG%==DEFRAG DSKDFRAG
```

Now when you choose the Defrag option from your CONFIG.SYS menu, your system will run the Defrag batch file, then reboot under your default menu settings.

—T.R.

PC TOOLBOX

# Show Me the Way To Go Home

*Thomas Wolfe was wrong—you* can *go home again. But doing so requires the help of some clever batch programs and the two utilities featured here.*

by Robert L. Hummel

It happens to me all the time: I'll be working on something when suddenly I get the urge to run a different application. It might be my appointment calendar, or my e-mail program, or even a spreadsheet to balance my checkbook. So I execute whatever shortcut batch program will take me to the correct drive and directory and launch the program.

After performing my crucial task, I quit the new application. But instead of going back to the drive and directory where I started, the application dumps me unceremoniously wherever it chooses. To resume my previous work, I have to remember where I was, then backtrack through drives and directories.

My shortcut batch programs do a great job of taking me somewhere else, launching programs, and automating otherwise tedious tasks. But they universally lack the ability to undo the things they do so well. It was high time, I decided, that my batch programs remembered where I was and took me home again.

### Now, Where Am I?

If you plan to return to your current location, the first thing you'd better find out is exactly where you are.

One way of doing so is to execute the DOS CD (*change directory*) command, with no arguments. In response, DOS displays the current drive and directory. For example, execute CD and you might see the following display:

```
C>CD
C:\GAMES\DOOM
C>
```

It's easy to redirect the output of the CD command to a file. And using a complex array of tricks and techniques, I created a gaggle of interconnecting batch programs that let me save my current drive and directory, then restore them later. But, to be honest, the solution was far from pretty.

To simplify the task of saving my current location and restoring it later, I decided to use Debug to create a couple of more powerful tools. The results of my effort are the DRIVEIS.COM and DIRIS.COM utilities discussed here. DRIVEIS.COM writes the current disk-drive letter to your display and returns the drive number as an exit code, while DIRIS.COM writes the current directory to your display along with an optional prefix string.

Before you can use DRIVEIS or DIRIS, you'll have to create them. To convert the SCR Debug scripts shown in the accompanying listings (opposite) to their executable equivalents, follow the simple instructions in the "Debug Scripts" section of "How to Use This Magazine" (page 63 in this issue).

The syntax for DRIVEIS couldn't be simpler; it takes no arguments and accepts no switches. Just type `DRIVEIS` at the command prompt, and the program writes the current drive letter followed by a colon (:). In this case, the standard output device is your display.

Writing to the display is great if you're human. But if you're a batch

---

*Robert L. Hummel is currently bivouacked near the Antarctic circle, awaiting retrieval by a Russian ice-breaker. When not writing about computers, he enjoys surfing the 40-foot swells off Peter I Island and making sealskin coats.*

**DRIVEIS.SCR creates the DRIVEIS.COM program, which writes the current disk-drive letter to your display and returns the drive number as an exit code.**

```
N DRIVEIS.COM
A 100
CLD
MOV   AH,19
INT   21
PUSH  AX
ADD   [11C],AL
MOV   AH,40
MOV   BX,1
MOV   CX,4
MOV   DX,11C
INT   21
POP   AX
MOV   AH,4C
INT   21
DB 41 3A D A

RCX
20
W
Q
```

*End*

program, it's less than ideal. To make the current drive information more accessible to batch programs, DRIVEIS also returns the current drive as an exit code you can test with the IF ERRLORLEVEL batch command. DRIVEIS returns an exit code of 0 (zero) if the current drive is A, 1 if B, and so on.

The DIRIS utility is a little more complex, but that's a consequence of its greater flexibility. Here's the syntax:

```
DIRIS ["prefix_string"]
```

Execute DIRIS with no parameters, and it writes the current directory—starting from the root-directory backslash—to the standard output device. The current drive identifier isn't displayed as part of DIRIS's output.

As you can see, DIRIS accepts an optional prefix string argument. If included, all characters between the quotes will be output, followed by the current directory string. This lets you insert a command or other text before the directory string. The reason for this will become clear as we put DIRIS to use.

### Executing a Simple SAVE

In the most general case, changing locations under DOS requires that you change both drive and directory. Type a drive specifier, such as C:, and DOS immediately switches you to that drive. Use the CD command followed by a directory specification, and DOS switches you to that directory—on the current drive.

Using standard DOS commands, you simply can't change both your drive and your directory at the same time. Using DRIVEIS and DIRIS, however, it's easy to expand DOS's capabilities—making it return you to a previously saved drive and directory. To see how, create a batch program called SAVE.BAT, which contains the following two lines:

```
DRIVEIS > C:\HOME.BAT
DIRIS "CD " >> C:\HOME.BAT
```

Now, let's assume that you execute SAVE from the F:\GAMES\DOOM directory and examine what happens. First, DRIVEIS retrieves the current drive and outputs the string F:, followed by a carriage-return/line-feed pair. The DOS redirection facility writes this output to the file C:\HOME.BAT. Next, the DIRIS command appends the string CD (then a space), followed by the current directory, to the same file. When SAVE finishes executing, HOME.BAT contains the following two lines:

```
F:
CD \GAMES\DOOM
```

You're now free to roam. At some point in the future, regardless of your current drive or directory, executing the command HOME will return you instantly to F:\GAMES \DOOM. To update your home drive and directory, run SAVE anytime.

### Paths for True Wanderers

Combining SAVE.BAT and HOME.BAT is great, but it has one important

**DIRIS.SCR creates the DIRIS.COM program, which writes the current directory to your display along with an optional prefix string.**

```
N DIRIS.COM
A 100
CLD
MOV    SI,81
LODSB
CMP    AL,D
JZ     11E
CMP    AL,22
JNZ    104
LODSB
CMP    AL,22
JZ     11E
CMP    AL,D
JZ     11E
MOV    AH,2
MOV    DL,AL
INT    21
JMP    10D
MOV    AH,47
SUB    DL,DL
MOV    SI,143
INT    21
DEC    SI
JMP    130
MOV    AH,2
MOV    DL,AL
INT    21
LODSB
OR     AL,AL
JNZ    12A
MOV    AH,2
MOV    DL,D
INT    21
MOV    AH,2
MOV    DL,A
INT    21
RET
DB   5C

RCX
43
W
Q
```

*End*

limitation. Each time you execute SAVE, it overwrites your old HOME.BAT file. That's fine—as long as you don't wander too far. But for the truly mobile, the ability to save only one home path is too limiting. For those adventurous souls, I created PUSH.BAT and POP.BAT, shown in the third and fourth listings (this page, left and right).

**PUSH.BAT uses the FOR command to save home paths with as many as ten return addresses. Note that the FOR line shows three lines of overflow here; type in FOR through ...A.BAT as one line.**

```
@ECHO OFF
SET FILE=FULL
FOR %%A IN (9 8 7 6 5 4 3 2 1 0)
  DO IF NOT EXIST
  C:\HOME%%A.BAT SET
  FILE=C:\HOME%%A.BAT

IF %FILE%==FULL GOTO ISFULL

DRIVEIS > %FILE%
DIRIS "CD " >> %FILE%
SET FILE=
GOTO END

:ISFULL
ECHO CAN'T PUSH, STACK IS FULL

:END
```

*End*

**POP.BAT uses FOR and CALL commands to send you back to where you started. Note that the FOR line shows two lines of overflow here; type in FOR through ...A.BAT as one line.**

```
@ECHO OFF
SET FILE=EMPTY
FOR %%A IN (0 1 2 3 4 5 6 7 8 9)
  DO IF EXIST C:\HOME%%A.BAT
  SET FILE=C:\HOME%%A.BAT

IF %FILE%==EMPTY GOTO ISEMPTY

CALL %FILE%
DEL %FILE%
SET FILE=
GOTO END

:ISEMPTY
ECHO CAN'T POP, STACK IS EMPTY

:END
```

*End*

PUSH operates on the same principle as SAVE.BAT, but instead of saving only one return address, PUSH can save up to ten, in files named HOME0.BAT, HOME1.BAT, and so on up to HOME9.BAT.

To avoid overwriting existing files, PUSH uses the FOR command to generate and test each possible filename in descending order. When the FOR command finishes executing, PUSH has set the FILE environment variable to the lowest-numbered file that doesn't already exist. (If all possible filenames exist, it displays an error message.) Then it writes to the new file the commands to switch the drive and directory.

You can retrace your steps easily with the POP.BAT program. Using the same FOR command technique, but listing the file numbers in ascending order, POP looks for the highest-numbered existing file. (If none exists, it displays an error message.) POP uses the CALL command to execute this file, changing the drive and directory, then deletes the file. Each POP undoes the most recent PUSH.

## Home Run

PUSH and POP are great when you execute them from the command line. But don't neglect their use in other batch programs using the CALL command.

For example, the MAIL.BAT batch program I use to launch my communications program used to change my current drive and directory, leaving me stranded. Rather than execute PUSH and POP manually, I modified MAIL to call PUSH and POP, as shown here:

```
CALL PUSH
D:
CD \PROCOMM
PROCOMM
POP
```

Now, no matter where I am when I decide to read my mail, I know I'm going home again. ■

DOS TIP

## FAST BATCH COMMENTS

DOS's batch processor is simpleminded. As it goes through a batch program, it carefully reads each line to determine whether it contains a command. Although you and I know at a glance that remark lines starting with the keyword REM don't need to be executed, DOS actually executes a command called REM, which wastes time.

You can speed up your batch programs by helping DOS decide more quickly that it needs to skip remarks. When DOS encounters a line that begins with a colon (:), it assumes that the line is a label and immediately skips it, having read only one character. So the following comment:

```
REM Copies my files
```

executes more slowly than this one:

```
:Copies my files
```

If your program uses labels, you'll want to avoid any chance that your comments might be interpreted as labels. To do so, simply use two colons to begin a comment:

```
::Copy my files
```

—Robert L. Hummel

BATCH-FILE MEDIC

# Mastering Your Batch-File Tools

*How much can you hammer on this old DOS before it breaks? Stay tuned for some CHOICE tips, and then we'll CALL it a day.*

by Hardin Brothers

Originally, batch files were supposed to be nothing more than a way to automate a simple series of commands: Do this, do that, do something else, and then stop. Probably 80 percent of the batch files in use, including most users' AUTOEXEC.BAT files, are still built on that premise.

But many of us seek more from our batch files. We want to display menus, accept user input, branch hither and yon, run subroutines, start other batch files, and generally do many of the tasks that Basic, C, and Pascal programs can perform.

So how far can you stretch DOS's batch-file language before it breaks? Although no one claims that it's as powerful as a full-fledged programming language, you can do much more with it than its developers imagined.

---

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This month, we'll look at two of the tools that give batch files extra power. The CHOICE command lets you select options from a menu. The CALL command runs a second batch-file program and can also simulate subroutines.

Instead of demonstrating the CALL and CHOICE commands with a long sample batch file, I'll provide a total of 11 hints that will help you use these tools more effectively. The tips offered here address questions and problems presented in letters from readers of previous installments of "Batch-File Medic."

## MAKING A CHOICE

Before DOS 6.x, users could pick from hundreds of incompatible input utilities, almost always designed to let you select from a menu.

Microsoft introduced the CHOICE command in DOS version 6.0 to replace these utilities. Like much of DOS, CHOICE seems simple, but its underlying structure is complex. Unless you're thoroughly familiar with it, the following (legitimate) line, for example, probably looks like gibberish:

```
CHOICE /C:ABX /N /S /TX,10
  "Make a choice "
```

This line instructs your system to run CHOICE.COM, the program containing DOS's CHOICE command. You can choose to press A, B, or X. The /N switch tells CHOICE to not display its prompt, which in this case would be [A,B,X]. The /S switch tells CHOICE to accept keystrokes only in the case the /C: option is using, which in this example is uppercase.

/TX, 10 tells CHOICE that if the user doesn't respond in ten seconds, CHOICE should select the default X automatically. "Make a choice" at the end is the text CHOICE will display to tell the user what to do.

With so many choices (pun intended), the CHOICE command can be confusing. But you can use it with confidence if you follow a few simple rules.

### TIP #1 Test CHOICE at the command line.

CHOICE.COM is a standard program you can run from the DOS prompt. If you want to use a complex form of CHOICE, try it at the command line before you put it into a batch file. This technique lets you refine a CHOICE command and make it work the way you want without the drudgery of editing and running a batch file over and over.

## TIP #2 Put text in quotes.

If you include text for the user in the CHOICE command, put it in quotation marks. That way, you control the spacing before and after the text, instead of letting CHOICE guess about what spacing you want to use. If you don't use /N or quotes, CHOICE will probably jam its prompt against your text, making the prompt difficult to read. To see the difference, try these two commands:

```
CHOICE Yes or No
CHOICE "Yes or No "
```

## TIP #3 Use ANSI to emphasize text.

You can give your menus pizzazz by using ANSI commands as part of the text string. Why should you settle for dull white-on-black text when you can use colors and blinking text to draw attention to the prompt?

For example, the following command line displays the prompt as blinking white on red. Replace each arrow with the escape character; in EDIT.COM, press Ctrl+P and then Esc to create it:

```
CHOICE "←[0;37;41;1;5mYes or No
  ←[0m"
```

## TIP #4 Consider unusual keys.

Most menus created with CHOICE use A, B, C (set up as /C:ABC) or 1, 2, 3 (/C:123) for menu options. But you can also use the Esc key, function keys, and cursor keys for choices.

Open DOS's Help function, pick ANSI, and scroll down the screen. There you'll find a list of key codes. You can use any key with a one-number key code, or a key code of zero plus a second number, as a menu choice.

To use Esc, just put ASCII code 27 in the list of choices after the /C: option. If you use EDIT.COM to create your batch files, press Ctrl+P and then Esc.

To use function keys, use the second number as the ASCII code. For example, for F1, listed as 0;59, press Ctrl+P and hold down Alt while you type 59 on the numeric keypad. You'll see an alphabetic character or a symbol on screen, but CHOICE will now be programmed for that function key.

Don't use F2 or F4 on your menu, though, because CHOICE and DOS will interpret the code as a redirection symbol.

If you use a function key or other key with a code of zero plus a number, you'll hear a beep when you press it, but your menu will still work correctly.

## TIP #5 Use /N with unusual key lists.

If you use any unusual keys, as described in Tip #4 above, they won't appear correctly in CHOICE's

## DOS TIP LOOK BEFORE YOU DELETE

DELTREE is a versatile command, but you have to handle it with care—one slipup and you might delete megabytes of data. What bothers me most is that DELTREE displays only the name of the parent directory when it asks you to confirm that you want to delete a certain tree. For added insurance against accidents, I wrote DT.BAT and its companion, DT1.BAT. DT.BAT displays a diagram of the full tree you're about to delete, so that you'll see exactly what you'll remove. DT1.BAT, which DT.BAT calls, deletes the files or directories.

The syntax for executing DT.BAT is like DELTREE's. For example, instead of typing `DELTREE \TEXT \DATA` at the DOS prompt, type `DT \TEXT \DATA`. Wildcards are handled differently, however. When you use wildcards with DELTREE, all matching files and directories are deleted, but DT.BAT deletes only files. This safeguard lets you use a command such as DT *.BAT DAT* to erase several files at once—without worrying that you might delete directories, too.

A word of warning: My programs don't work in DR DOS or Novell DOS. Both use a method of checking for a directory that's different from DOS's.

—Richard Penn

**DT.BAT displays a tree diagram of the files and directories you're about to delete, then calls DT1.BAT.**

```
@ECHO OFF
SHIFT
FOR %%N IN (%0 %1 %2 %3 %4 %5 %6 %7 %8 %9) DO CALL DT1 %%N
```

*End*

**DT1.BAT, called from DT.BAT, uses DELTREE to delete files and directories.**

```
IF NOT EXIST %1\NUL GOTO FILENAME
TREE %1
ECHO.
:FILENAME
DELTREE %1
ECHO.
```

*End*

prompt. To avoid confusing yourself or others who use your batch file, create your own prompt and add it to the end of the text string, as shown here:

```
CHOICE /N /C:BCD [F8,F9,F10]
```

### TIP #6

### Don't use /T with zero delay.

The /T option includes both a default character and a time delay. For example, /TY,5 means "Select option Y after a five-second delay." If you use a delay of zero, CHOICE waits indefinitely for a keystroke, just as though you'd omitted the /T option.

That isn't the way CHOICE is supposed to work, according to Microsoft's documentation; it's just the way things turn out.

### TIP #7

### Test keys in reverse order.

CHOICE returns the user's selection as an ERRORLEVEL your batch file can test. The first option is ERRORLEVEL 1, the second is ERRORLEVEL 2, and so on.

But ERRORLEVEL is a strange command. This test:

```
IF ERRORLEVEL 1 GOTO . . .
```

really means "if the ERRORLEVEL is 1 or higher, go to . . . ."

To get around this peculiarity (which may be helpful in other situations), check ERRORLEVELS in descending order. For example:

```
CHOICE /C:ABC "Format which drive "
IF ERRORLEVEL 3 GOTO FMT_C
IF ERRORLEVEL 2 GOTO FMT_B
IF ERRORLEVEL 1 GOTO FMT_A
```

If your tests start with ERRORLEVEL 1, the program will always jump to FMT_A, unless you use this syntax:

```
IF ERRORLEVEL 1 IF NOT ERROR-
  LEVEL 2 GOTO FMT_A
```

### TIP #8

### Save the user's selection.

Sometimes you may want to save the user's selection for later processing. The easiest way to do so is to use an environment variable, like this:

```
CHOICE /C:ABC "Make a choice "
FOR %%N IN (1,2,3) DO IF ERROR-
  LEVEL %%N SET OPT=%%N
IF %OPT%==1 ECHO Option A chosen
IF %OPT%==2 ECHO Option B chosen
IF %OPT%==3 ECHO Option C chosen
```

Of course, in a real batch file, the IF statements would probably do more than display a message. Your batch file could also test the value of OPT several times if necesary.

## PLEASE CALL HOME

DOS's batch language has always let one batch file start another, just as a batch file can run a DOS command or start a program. But when one batch file starts another, a strange thing happens: DOS ignores the remainder of the first batch file and runs the second as though it were the first. For example:

```
@REM TEST1
TEST2.BAT
. . . Never executed
```

Microsoft added the CALL command to the batch language in DOS version 3.30 to get around this problem. If one batch file calls another, the first is suspended while the second runs. When the called file ends, the first (or calling) batch file resumes where it left off:

```
@REM TEST1.BAT
CALL TEST2
... Executed after TEST2.BAT is done
```

CALL is very useful, but note that it does require some care.

### TIP #1

### Endless Loop: Don't CALL back.

The greatest pitfall is getting lost in a series of CALLs. If you aren't careful, you may end up with one batch program CALLing another, which in turn CALLS a third, which then CALLS the first, which again CALLs the second, and so on. Don't look so smug—many good batch-file programmers have fallen into this trap.

I recently received a set of three batch files from a reader. Together, they implemented an ambitious backup plan. Each included a menu that could lead either to routines within the batch file or to another batch file. If the user made just the right choices, the three files made a CALL chain and the programs failed.

Most of the time, however, the files' users didn't select those particular menu items and everything appeared to work.

To avoid a CALL chain, draw a diagram of the CALLs in each file. If you've unintentionally created a CALL chain, your diagram will show it clearly and you can then fix the problem.

### TIP #2

### Use CALL for subroutines.

A subroutine is part of a program you can start from another section of the same program. When the subroutine ends, the program resumes from its original location.

Batch files don't include subroutines in the classic sense. DOS's batch language offers no GOSUB or RETURN commands, as Basic does. But perhaps without realizing it, Microsoft added subroutines to batch files when it added the CALL command.

The CALL command you use to start a subroutine usually looks something like this:

```
CALL %0 SUBR_
```

When a batch file starts, %0 contains its name as the user entered it on the command line. So CALL %0 will restart the same batch file (unless, perhaps, the batch file has changed the default directory).

For example, if the name of the batch file is TEST.BAT and the user runs it by typing `TEST`, then the batch file interprets the CALL thus:

```
CALL TEST SUBR_
```

When the batch file runs itself again, it sees SUBR_ as a special command-line parameter. It should be a string the user is unlikely to type when he or she first starts the batch file.

The batch file sees this parameter and jumps to a special section of itself. The second copy of the batch file ends when the subroutine is complete and returns to the first copy.

For an example of how to use a subroutine, as well as the CHOICE command, see the accompanying program listing (below right) for the batch file DELALL.BAT, which can delete several files with a single command.

## TIP #3 PAUSE to end a called batch file.

If a simple batch file needs to end prematurely, it usually does so with this line:

```
GOTO END
```

The last line of such a batch file typically looks like this:

```
:END
```

But that won't work if you want to stop all batch-file processing from within a called batch file. The current batch file will end, but the program that called it will continue.

Interestingly, if the user presses Ctrl+C while a called batch file is executing and then answers *yes* to DOS's "Terminate batch job?" question, all batch-file processing stops. So the way to break out of all batch processing is to duplicate what the user does.

The easiest way to press Ctrl+C for the user is with a line like this:

```
ECHO ^C | PAUSE > NUL
```

Replace ^C with the Ctrl+C character: If you use EDIT.COM, press Ctrl+P and then Ctrl+C. The character will appear as a heart on screen.

This line tells DOS to send the Ctrl+C character to the PAUSE command and to send the PAUSE command's output to the NUL device so that the user won't see it. In essence, this line runs the PAUSE command and then presses Ctrl+C for the user.

Unfortunately, this isn't a perfect solution. After you've sneakily pressed Ctrl+C for the user, DOS asks for confirmation. The user will still see "Terminate batch job? (Y/N)" and must press `Y` to actually stop batch processing.

If the user presses `N`, the program will continue. If anyone knows of a way to hide this DOS prompt and press `Y` for the user as well as Ctrl+C, let me know.

Until then, you can avoid the potential problem of the user pressing `N` to continue the program when you want it to end. Simply add two more lines, like this:

```
:END_ALL
ECHO ^C | PAUSE > NUL
GOTO END_ALL
```

DOS's "Terminate batch job?" prompt will appear over and over until the user finally relents and presses `Y`.

## MORE TO COME

I'd like to thank all of you for your letters addressed to this column. Whether you send me suggestions, ask for help, or offer a critique of techniques I've explained, I use your letters to decide what topics to cover each month.

The hints here are responses to a half-dozen readers' questions, but I trust they'll help all of you write better batch files. ■

**DELALL.BAT deletes up to nine files or groups of files. (Each filename can include wildcards.) The program asks for confirmation before deleting each group of files. This program is a good example of how to use CALL to run a subroutine.**

```
@ECHO OFF
GOTO Start
:HELP
ECHO This batch file deletes one or several groups
ECHO of files. Start it with a command line like
ECHO this:
ECHO.
ECHO    %0 *.TMP C:\WINDOWS\TEMP\*.* C:\WP\*.BK!
ECHO.
GOTO END
:START
IF "%1"=="" GOTO HELP
IF %1==SUBR_ GOTO SUBR_
:: This is where the real processing starts
FOR %%F IN (%1 %2 %3 %4 %5 %6 %7 %8 %9) DO CALL %0 SUBR_ %%F
GOTO END
:: This is the end of the main program
:: This is the subroutine that does the actual
:: file deletion
:SUBR_
CLS
DIR %2 /O /L
ECHO.
CHOICE "Delete this file "
IF ERRORLEVEL 2 GOTO END
ECHO Y | DEL %2
:END
```

*End*

BATCH-FILE BASICS

# Symbolic Victory: Part 2

*It's fundamental: Brushing up on DOS's suite of symbols is one sure way to boost your batch-file IQ.*

by Eric Maloney

Scan even a simple batch file, and you'll probably see several symbols: an "at" sign (@) preceding an opening ECHO OFF statement, periods (.) trailing ECHO commands, maybe a few colons. Complex batch files often contain the full complement of symbols, which is some 14 members strong. If you want to read and write batch language, you have to understand these symbols.

To save you the time and trouble of inching through DOS's on-line help in search of explanations and examples, I've assembled a two-part primer on batch-file symbols. In the last issue (*DOS World* #22, July 1995, page 35), I introduced six symbols: the at sign, the period, the percent sign (%), the double equal sign (==), the single colon (:), and the double colon (::). This month, I tackle the remaining eight symbols. (See the accompanying table, "Symbol Summary," page 38, for a synopsis of all 14 symbols.)

As before, I'll use my phone-list program, PHONE.BAT (page 40), to provide examples of how you can use each symbol. (See the sidebar "Using PHONE.BAT," page 39, for assistance.)

### The Equal Sign (=)

Use a single equal sign to assign a value to an entry in DOS's environment space—a place in memory that holds important information about your computer's settings. For example, the environment includes an entry describing the search path established in your AUTOEXEC.BAT file. When you type the name of a program you want to run, DOS looks to the path stored in the environment to determine which directories it should check.

You can view the contents of your environment by typing SET at the DOS prompt. Here's a typical display:

```
COMSPEC=C:\COMMAND.COM
PATH=C:\WINWORD;C:\WINDOWS;C:\DOS;
  C:\BAT;
PROMPT=$P$G
```

You can change the contents of the environment at the DOS prompt by issuing the appropriate command, followed by an equal sign and the new string. For example, if you type this command at the DOS prompt:

```
PROMPT=Hello
```

DOS displays the message "Hello" as its prompt. Type SET and you'll see:

```
PROMPT=Hello
```

To remove the entry, type PROMPT=. The prompt will return to its default, C>.

PROMPT is one of several keywords DOS reserves for the environment; PATH is another. Your AUTOEXEC.BAT file probably contains a PATH statement that looks like this:

```
PATH=C:\DOS;C:\WINDOWS;C:\WP;
```

What makes the environment particularly interesting to batch-file programmers is that you can create your own entries. More commonly called *variables*, they're similar to variables such as %1 and %2, which I discussed in the last issue.

---

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The difference is that instead of assigning a value to a variable by providing parameters when you execute your batch file, you use the SET command to assign environment variables within the batch file. This statement, for instance, creates the variable MESSAGE, containing the string "This is a message":

```
SET MESSAGE=This is a message
```

PHONE.BAT uses one environment variable, FILENAME. Its value—%4, the fourth parameter typed at the command line—is set in line 23:

```
SET FILENAME=%4
```

For example, if you type the following line at the DOS prompt:

```
PHONE John Smith 555-1111 PERSONAL.LST
```

you assign to FILENAME the value PERSONAL.LST. Later, the batch file saves the new number to the file PERSONAL.LST.

What if you don't supply a fourth parameter when you execute PHONE.BAT? FILENAME gets no value and therefore isn't created. When the IF statement in line 26 sees that FILENAME is empty, the batch file then assigns the variable a default value, MAINLIST.LST.

Now that the variable FILENAME exists, how does the batch file use it? Much as it would a variable created from the command line, but it requires two percent signs instead of one.

### Two Percent Signs (%*variable*%)

After you give a variable a value, you use that value by putting percent signs around the variable. To see how this works, create a batch file called MESSAGE.BAT:

```
@ECHO OFF
SET MESSAGE=This is a message
ECHO %MESSAGE%
```

When you run the batch file, it first gives the variable MESSAGE the value "This is a message." Then it uses the ECHO command to display the contents of the variable:

```
This is a message
```

Line 27 uses a similar construction to tell the user the name of the file in which the new entry will be saved.

### The Greater-Than (>) and Double Greater-Than (>>) Signs

The greater-than sign sends the output of a command to a file or device instead of to the screen. For example, this command creates a file called DIR.TXT and routes the output of DIR to that file:

```
DIR>DIR.TXT
```

You may insert a space either before or after the symbol; DIR >DIR.TXT, DIR> DIR.TXT, and DIR > DIR.TXT are all legal commands.

## SYMBOL SUMMARY

| Symbol | Line Number of First Reference in PHONE.BAT | Function |
|---|---|---|
| At sign (@) | 1 | Stops the remainder of the line from being displayed. |
| Period (.) | 2 | Used with ECHO, displays a blank line. |
| Percent sign (%) | 3 | Precedes a number from zero to 9; indicates a replaceable parameter, a value you set when executing a batch file. |
| Double equal sign (==) | 3 | Compares two values in an IF statement. |
| Colon (:) | 7 | Precedes a line label. |
| Double colon (::) | 8 | Precedes a remark; replaces REM. |
| Equal sign (=) | 23 | Sets the variable on the right side of a command to the value of the string or variable on the left side. |
| Two percent signs (%*variable*%) | 27 | Indicates an environment variable, usually set within the batch file. |
| Double greater-than sign (>>) | 30 | Adds data to a file; if the file doesn't exist, DOS creates it. |
| Single greater-than sign (>) | 38 | Reroutes data to a device or new file. |
| Single less-than sign (<) | 38 | Reroutes data from a file to a command. |
| Double percent sign (%%) | 65 | Precedes a variable in a FOR...IN...DO statement. |
| Pipe symbol (\|) | 84 | Sends the output of one program as input for the next program. |
| Slash (/) | none | Used within a FOR...IN...DO statement, breaks strings in two. |

If you already have a file called DIR.TXT, the single greater-than sign tells DOS to overwrite that file with the new one. To append data to an existing file, use a double greater-than sign:

```
DIR>>DIR.TXT
```

Whenever you type this command, the new directory listing is added to the end of DIR.TXT.

In line 30, PHONE.BAT uses a double greater-than sign to save the new phone number:

```
ECHO %2, %1__%3>>%FILENAME%
```

Greater-than and double greater-than signs offer any number of terrific uses for on-the-fly note taking and printing. For example, you can maintain a file called NOTES containing your voice-mail messages. You can add to the file by typing something like the following:

```
ECHO Call Jesse about rescheduling
  soccer practice>>NOTES
```

By itself, ECHO would display the message on screen. With double greater-than signs, it sends the message to NOTES, where you can read it later by executing the TYPE command or loading the file into a text editor.

Similarly, this command sends the message to your printer, assuming it's attached to LPT1:

```
ECHO Call Jesse about rescheduling
  soccer practice>LPT1
```

You can also use greater-than signs to send data to other devices, with interesting results. Consider NUL, for example. When you send data to this dummy device, your data disappears into the ozone. At first glance, calling on a nonexistent device seems useless, sort of like connecting your TV antenna to a vacuum cleaner.

But NUL is invaluable when you don't want to display the output of a command or program. An example appears in line 39, in the sorting routine:

```
COPY PHONE.TMP %2>NUL
```

This copies the file PHONE.TMP to a file whose name is contained in the variable %2. Normally, DOS displays this message when copying finishes:

```
1 file(s) copied
```

Routing the command to the NUL device suppresses the message.

### The Less-Than Sign (<)

Not as common but certainly as useful as the greater-than sign is the less-than sign. Just as the former sends output to a file, the latter takes input from a file. For example:

```
MORE<DIR.TXT
```

The DOS program MORE receives data from the file DIR.TXT and displays that data one screen at a time.

The less-than sign is often used with the SORT command, as in line 38:

```
SORT <%2 >PHONE.TMP
```

In this case, the variable %2 contains a filename, typed as a parameter at the command line. So if you use this command to execute PHONE.BAT:

```
PHONE /S MAINLIST.LST
```

## USING PHONE.BAT

Although I designed PHONE.BAT primarily as a teaching aid, it's not just a demonstration tool. After you finish studying how I use symbols to do what needs doing, put the listing to work keeping track of your phone list.

To add a phone number, use the following syntax:

```
PHONE firstname lastname number [filename]
```

The filename is optional. If you omit it, the number is added to the main list, MAINLIST.LST. If you specify an alternate file, you must include the extension LST (for example, BUSINESS.LST or PERSONAL.LST).

Entries are stored in this order:

```
lastname firstname number
```

To find a number, use this command:

```
PHONE /F string
```

The string may be any part of a number or name, and you may use upper- or lowercase characters. PHONE.BAT searches all phone lists for the string.

To list all numbers in a file, use this command:

```
PHONE /L filename
```

To sort, use this command:

```
PHONE /S filename
```

Note that whenever you use /L or /S, you must include a filename.

The main article discusses symbols in the order in which they first appear in the accompanying listing. When you type in the listing, don't include the line numbers.

**—E.M.**

**The demo program PHONE.BAT features 13 of DOS's 14 batch-file symbols; it lets you store phone numbers in a database and retrieve them when you need them. Line numbers are for reference only; don't type them in.**

```
@ECHO OFF
ECHO.
IF "%1"=="" GOTO HELP
GOTO START
This batch file stores and retrieves
phone numbers typed at the DOS prompt.
:START
::The following IF statements capture
::information the user provides at
::the command line.
CLS
IF "%1"=="/s" GOTO SORTING
IF "%1"=="/S" GOTO SORTING
IF "%1"=="/f" GOTO FINDING
IF "%1"=="/F" GOTO FINDING
IF "%1"=="/l" GOTO LISTING
IF "%1"=="/L" GOTO LISTING
IF "%1"=="/h" GOTO HELP
IF "%1"=="/H" GOTO HELP
::
:ADDNUMBER
::This routine adds an entry to a phone list.
SET FILENAME=%4
IF "%2"=="" GOTO HELP
IF "%3"=="" GOTO HELP
IF "%4"=="" SET FILENAME=MAINLIST.LST
ECHO Adding to phone list %FILENAME%:
ECHO.
ECHO %2, %1__%3
ECHO %2, %1__%3>>%FILENAME%
SET FILENAME=
GOTO END
::
:SORTING
::This routine sorts a phone list.
IF "%2"=="" GOTO SORTABORT
IF NOT EXIST %2 GOTO NOFILE
SORT <%2 >PHONE.TMP
COPY PHONE.TMP %2>NUL
DEL PHONE.TMP
ECHO Phone list sorted.
GOTO END
:NOFILE
::This routine shows an error message
::if a wrong filename is specified.
IF NOT EXIST %2 ECHO Invalid list name!
:SORTABORT
::This routine displays an error message
::if the user doesn't specify a phone list.
ECHO.
ECHO Proper syntax for sorting is:
ECHO.
ECHO PHONE /S [listname]
ECHO.
ECHO Your phone lists are:
ECHO.
DIR *.LST /B
GOTO END
::
:FINDING
::This routine searches all phone lists for
::a name or number.
IF "%2"=="" GOTO FINDABORT
ECHO Finding number:
FOR %%A IN (*.LST) DO FIND /I "%2" %%A
GOTO END
:FINDABORT
::This routine displays an error message
::if the user doesn't specify a string.
ECHO Proper syntax for finding a number is:
ECHO.
ECHO PHONE /F [string]
ECHO.
ECHO The string can be any part of a
ECHO name or number. All phone files
ECHO are searched.
GOTO END
::
:LISTING
::This routine displays a phone list
::specified at the command line.
IF "%2"=="" GOTO LISTABORT
IF NOT EXIST %2 GOTO NOFILE
TYPE %2 | MORE
GOTO END
:NOFILE
::This routine displays an error message
::if an improper filename is specified.
IF NOT EXIST %2 ECHO Invalid list name!
ECHO.
:LISTABORT
::This routine displays an error message
::if the user doesn't specify a phone list.
ECHO Proper syntax for viewing a list is:
ECHO.
ECHO PHONE /L [listname]
ECHO.
ECHO Your phone lists are:
ECHO.
DIR *.LST /B
GOTO END
::
:HELP
::Generic help screen
CLS
ECHO HELP SCREEN
ECHO.
ECHO To add a number:
ECHO PHONE [firstname] [lastname] [number] [listname]
ECHO [listname] is optional.
ECHO.
ECHO To sort the list:
ECHO PHONE /S [listname]
ECHO.
ECHO To find a number:
ECHO PHONE /F [string]
ECHO.
ECHO To list all numbers:
ECHO PHONE /L [listname]
:END
ECHO.
```

*End*

the program assigns the value MAINLIST.LST to the variable %2. Written in plain English, line 38 says: Sort the file MAINLIST.LST and route the results to the file PHONE.TMP.

### The Double Percent Sign (%%)

The third batch-file symbol involving a percent sign appears only in the FOR...IN...DO command. Its syntax is as follows:

```
FOR %%variable IN (set) DO action
```

If you're a novice, a FOR...IN...DO statement probably makes about as much sense as the back of Albert Einstein's napkin. Indeed, experienced programmers can write complex code around FOR...IN...DO statements. But the command isn't nearly as arcane as it looks.

FOR...IN...DO performs the same operation on a series of items, called a *set*. To see why FOR...IN...DO is so helpful, consider what you'd have to do if this construction weren't available.

For example, suppose you want to search through the files BUDGET.DOC, FORECAST.DOC, and SUMMARY.DOC for occurrences of the word *report*. On its own, the FIND command lets you search through only one file at a time:

```
FIND "report" /I filename
```

To search through three files, you'd have to issue the command three times. But FOR...IN...DO lets you issue the command just once. If you put FOR...IN...DO into a batch file called FINDALL.BAT, it might look like this:

```
@ECHO OFF
FOR %%A IN (BUDGET.DOC FORECAST-
  .DOC SUMMARY.DOC) DO FIND
  "report" /I %%A
```

On its first loop, the command puts the first item in the set, BUDGET.DOC, into the variable %%A and executes this command:

```
FIND "report" /I BUDGET.DOC
```

On its second and third loops, the command does the same thing for FORECAST.DOC and SUMMARY.DOC, respectively.

Conveniently, you may use wildcards in a DO set, just as you may with DIR. Thus, if BUDGET.DOC, FORECAST.DOC, and REPORT.DOC are your only DOC files, the following command achieves the same end as the previous example:

```
FOR %%A IN (*.DOC) DO FIND
  "report" /I %%A
```

The FOR...IN...DO loop in line 65 does essentially the same thing. The only difference is that instead of searching for a particular word, this line searches for a variable. Thus, typing the following command searches all files with the extension LST for the name *Smith*:

```
PHONE /F Smith
```

Another DOS command appearing often in a FOR...IN...DO loop is TYPE. From the DOS prompt, use TYPE to list the contents of only a single file:

```
TYPE filename
```

If you use a FOR...IN...DO loop in a batch file called TYPEALL.BAT, you can easily list the contents of multiple files:

```
@ECHO OFF
FOR %%A IN (%1) DO TYPE %%A
```

For example, use this command to display the contents of all files with the extension TXT:

```
TYPEALL *.TXT
```

Keep the following rules in mind when you use the FOR...IN...DO construction in your own batch files:

- The variable must be a single character.
- You may use any letter or number and most characters except for

## BRAIN TEASER

The first step in using symbols properly is knowing what they do and how they work. But DOS has more quirks than your Aunt Esther in Buffalo.

For example, the following batch file, TYPEALL.BAT, uses a FOR...IN...DO loop to consecutively display REPORT1.TXT, REPORT2.TXT, and REPORT3.TXT:

```
@ECHO OFF
FOR %%A IN (REPORT1.TXT
  REPORT2.TXT REPORT3.TXT)
  DO TYPE %%A
```

There's only one small problem: The files will scroll off the screen faster than you can read them. How can you pause the screen without resorting to the Pause key?

"Ah ha!" you say. Simply use a command such as this to pass the contents of the typed file through the MORE filter:

```
FOR %%A IN (REPORT1.TXT
  REPORT2.TXT REPORT3.TXT)
  DO TYPE %%A | MORE
```

"Ah ha!" I reply. Nice try, but no cigar. The pipe and MORE work fine if you use the command TYPE *filename* | MORE to list just one file. But they don't work as part of FOR...IN...DO.

The question, then, remains: How do you get the batch file to pause the display after every full screen?

What's your solution? One possible fix appears on page 42. Here's a hint: It uses the variable %0. It also uses six of the symbols discussed in my two-part primer on symbols.

If you have another solution, I'd love to see it. Mail it to *DOS World*, 86 Elm Street, Peterborough, NH 03458, or send it to us via CompuServe (**75300,2357**), MCI Mail (**543-6376**), or our bulletin board (**603-924-3181**; 8 data bits, no parity, 1 stop bit).

**—E.M.**

the equal sign, pipe, semicolon, comma, slash, less-than sign, greater-than sign, and double greater-than sign.

- If you use a letter, the variables in the FOR and DO portions of the statement must both be lowercase or both uppercase.
- You may use FOR...IN...DO from the DOS prompt, but, if you do so, you must precede the variables with a single percent sign.

### The Pipe Symbol (|)

A pipe sends the output of one command or program to another. It's often used with the DOS command MORE, as in this example:

```
TYPE filename | MORE
```

The output from the command TYPE is piped to the program MORE, which pauses after each full screen. PHONE.BAT's line 84 uses just such a command to display the contents of the file whose name has been passed from the DOS prompt to the variable %2.

For example, this command displays the file MAINLIST.LST:

```
PHONE /L MAINLIST.LST
```

Batch-file programmers often use pipes to send input to a program that asks the user for a response.

## BRAIN TEASER SOLUTION

```
@ECHO OFF
IF "%1"=="NEXTFILE" GOTO NEXT
FOR %%F IN (REPORT1.TXT REPORT2.TXT
  REPORT3.TXT) DO CALL %0 NEXTFILE %%F
REM>\END.BAT
\END.BAT
:NEXT
CLS
ECHO NOW TYPING THE FILE %2:
TYPE %2 | MORE
ECHO --More--
PAUSE>NUL
```

*End*

**Revised TYPEALL.BAT.**

The key to solving the problem is to go to a subroutine after the FOR...IN...DO loop retrieves a file and let the subroutine type the file. The problem is that if you use a GOTO, the batch file has no way of picking up where it left off within the FOR...IN...DO loop.

A batch file, however, may call another batch file—even itself—from within a subroutine. When the second batch file is done, it returns control to the first batch file at the point at which it suspended execution.

Here's how TYPEALL.BAT works. Let's say that you type `TYPEALL *.BAT` at the command line. On the first pass, TYPEALL.BAT checks the value of %1 against the string NEXTFILE. If %1 equals NEXTFILE, then the batch file jumps to the subroutine NEXT. Because %1 is empty, the statement tests false, and the batch file continues to the next line.

After the IF test fails, TYPEALL.BAT executes the FOR...IN...DO loop. Each time the loop executes, it calls itself, passing two parameters to its iteration: NEXTFILE and the name of the file to be typed. For example, on the first loop, this statement:

```
CALL %0 NEXTFILE %%F
```

is interpreted by DOS as this command:

```
CALL TYPEALL NEXTFILE REPORT1.TXT
```

The called version of TYPEALL.BAT once again checks the parameter %1 against the string NEXTFILE. This time, the test proves positive, and TYPEALL.BAT jumps to the subroutine NEXT, which types the file specified in the variable %1—REPORT1.TXT, the first time around. The batch file filters the file through the MORE command, thus pausing the scroll after each full screen.

At first glance, the PAUSE statement at the end of the NEXT routine might seem redundant. After all, isn't the whole purpose of MORE to pause the screen display? The answer is a qualified yes—MORE does the job, but only when the file is long enough to scroll off the screen. When TYPEALL.BAT types a short file that doesn't fill at least one screen, it returns to the FOR...IN...DO loop without pausing and grabs the next file, which then pushes part of the previous file off the display. For instance, if you wanted to display 20 files that contained less than a screen of text, TYPEALL.BAT would never stop. PAUSE forces TYPEALL.BAT to stop at the end of every file, no matter how short it is.

To create a cleaner and more consistent screen, I redirected PAUSE's "Press any key to continue. . ." message to the NUL device to prevent it from being displayed, and I replaced the message with the MORE command's:

```
ECHO -More-
```

There's one final bit of housekeeping: ending the batch file when the FOR...IN...DO loop is done processing the files to be typed. Most batch files end with an END subroutine at . . . well, at the end. But TYPEALL must finish with its NEXT subroutine, so that each iteration can return to the calling batch file.

The simple solution is to let TYPEALL create its own END command. The line after the FOR...IN...DO loop uses a greater-than sign to create a file called END.BAT in the root directory. END.BAT is completely empty—it contains zero bytes. When the next line runs END.BAT, END.BAT has nothing to do except return you to the DOS prompt. Because END.BAT is nothing more than a name, it uses no disk space.

**—E.M.**

**EXTRACT.BAT uses the FOR...IN...DO slash to separate a filename's base and extension. You can apply this batch-file tool in any number of ways, including automatic comparison and deletion of multiple file copies. To create the omega in DOS's EDIT.COM text editor, hold down the Alt key and type ASCII code 234 on the numeric keypad (Num Lock on).**

```
@ECHO OFF
SET NAME=%1
IF "%NAME%"=="" GOTO DONE
SET TNAME=%NAME%Ω
SET BASE=
SET CHAR=
:LP
SET TEMP=%TNAME%
IF "TNAME%"=="Ω" GOTO DONE
FOR %%A IN (/%TNAME%) DO SET TNAME=%%A
FOR %%A IN (/%TEMP%) DO IF %%A%TNAME%==%TEMP% SET CHAR=%%A
IF "%CHAR%"=="." GOTO DONE
SET BASE=%BASE%%CHAR%
GOTO LP
:DONE
ECHO Original filename: %NAME%
ECHO Base of filename: %BASE%
SET CHAR=
SET TEMP=
SET TNAME=
```

*End*

For example, if you type DATE, DOS gives you the current date and asks you to input the new date:

```
Current date is Wed 11-02-1994
Enter new date (mm-dd-yy):
```

You may avoid responding to the prompt by typing this command:

```
ECHO. | DATE
```

Remember, placing a period after an ECHO statement produces the same effect as pressing Enter.

Here's another, more dangerous, example. When you delete all the files in a subdirectory with the command:

```
DEL *.*
```

DOS prompts you with this brief message:

```
All files in directory will be
deleted! Are you sure (Y/N)?
```

To avoid pressing Y or N, use the following command:

```
ECHO Y | DEL *.*
```

The pipe sends the output of the ECHO command, Y, to DEL.

If you really want to take a walk on the wild side, you can redirect the entire mess to the device NUL, using a command such as this one:

```
ECHO Y | DEL *.* >NUL
```

Not only does this keep DOS from asking you whether you want to delete the files; it prevents DOS from warning you that it's deleting the files.

If you often need to clean out subdirectories fast, put this line into a batch file called WIPEOUT.BAT. Make sure, however, that you really want to clean the entire subdirectory before you use this batch file.

### The Slash (/)

The final batch-file symbol, the slash, has an obscure function within the set of a FOR...IN...DO statement that deserves more attention than it has received. It can break strings in two, which means that you can write a batch file that separates the base of a filename from its extension. When you have the base and extension in two environment variables, you can perform all sorts of file-management chores that otherwise aren't possible without utility programs.

In recent issues, *DOS World*'s technical editor, Hardin Brothers, provided a detailed explanation of the slash ("Batch-File Breakthrough," #19, January 1995, and #20, March 1995, page 36). What follows is a synopsis of Brothers' discussions.

DOS interprets a slash within the SET portion of a FOR...IN...DO command as an escape character. FOR...IN...DO discards the slash and interprets the next character as a single-byte parameter. If you display the variable following FOR, you'll see that the command breaks the string in the SET portion of the command (the information between parentheses) into two lines. For example, this line:

```
FOR %%C IN (/WHEEL) DO ECHO %%C
```

produces the following two lines:

```
W
HEEL
```

FOR...IN...DO sees the contents of the set as /W and HEEL. To interpret /W, FOR...IN...DO discards the slash and accepts W as the first character.

Brothers's batch file EXTRACT.BAT (above) demonstrates this technique; it breaks a filename into two parts: base name and extension. To use EXTRACT.BAT, type EXTRACT followed by a filename. For example, if you type this command:

```
EXTRACT SAMPLE.TXT
```

your screen displays the following:

```
Original filename: SAMPLE.TXT
Base of filename: SAMPLE
```

As Brothers notes, you can build on EXTRACT.BAT, creating a backup and file-deletion program. His version of just such a program, _DELBAK.BAT, appeared in March's "Batch-File Breakthrough: Part II." ■

DISASTER-RECOVERY TOOLS

# When Bad Things Happen to Good PCs

*You can recover from almost any computing disaster, if your system's first-aid kit contains these three kinds of programs.*

by Hardin Brothers

A corollary to Murphy's Law says that any complex system is a disaster waiting to happen. In my house, we have two such systems: our office computers. No matter how careful we are to keep them in top working order, one or the other breaks down every few months.

If your hardware fails, there's nothing you can do except replace part of the computer or take the system to a local repair shop. But, except for peripherals with moving parts like mice, computer hardware rarely fails. Most crises are caused by software problems, and most can be prevented or repaired with the appropriate utility.

You can recover from almost any computing disaster if you have three kinds of programs in your system's first-aid kit: a low-level hard-disk recovery and repair program, a general-purpose utility suite, and a good antivirus program. They'll cost you some money, but they're worth the expense. Just as you wouldn't stock your home first-aid kit with used rags and out-of-date aspirin, you shouldn't think of skimping on your computer's first-aid kit.

I'll look at several common disasters in this article and the first aid you can use to recover from each one.

Whether you agree with my brand choices or not, your first-aid kit should include a hard-disk recovery program like SpinRite, a general utility and recovery program like The Norton Utilities or PC Tools Pro, a dedicated diagnostic program like Check It Pro, and a virus-scan program like The Norton AntiVirus. (See the accompanying "Buyer's Guide Sampler," page 47, for more information on the products discussed here and additional programs. For a more comprehensive list of DOS diagnostic and recovery programs, see "The Second Annual Guide to Utilities," DOS World #16, July 1994, page 48.) With these tools in hand, you'll be able to diagnose and repair most of the disasters that are apt to hit your computer.

### It Worked Fine Last Time

The computer disaster that ties my stomach in knots fastest is a failing hard disk. A "Sector Not Found" error message chills my blood and stops everything else I'm doing.

The problem is that your computer gives little warning of a failing hard disk. Most hard drives include correcting circuitry that hides errors from DOS and your computer's BIOS until it's almost too late. Then, when an error does occur, few utilities can recover both the hard disk and your data.

One utility you can use for both preventive maintenance and error recovery is Gibon's **SpinRite 3.1**. It analyzes your hard disk, recovers most unreadable data, and renews the hard disk so that it will work more reliably in the future. It identifies sections of the disk that are failing and prevents those areas from being used in the future. It can also recover unreadable data from floppy disks. In other words, it does everything software can do to make your hard disk reliable.

---

*Technical Editor Hardin Brothers has been working with computers and writing about them for 15 years. He's* DOS World*'s "Reader Forum" and "Shareware Exchange" columnist and also serves as a contributing editor for* Maximize *magazine.*

SpinRite is also easy to use; it offers extensive on-line help and comes with a clear manual. To get started, you create a boot-up floppy and copy SpinRite to it; then simply boot from the floppy and run the program. The first time you run it, SpinRite will take a few moments to ferret out all your hard disk's secrets. The next time, it remembers what it has learned and runs quickly and easily.

The good news is you don't have to wait for trouble to use SpinRite. If you run it every couple of months, SpinRite will keep your hard disk in top shape. In my opinion, this is one program that belongs in everyone's computer first-aid kit to keep your hard disk running well.

### That's Not My Data

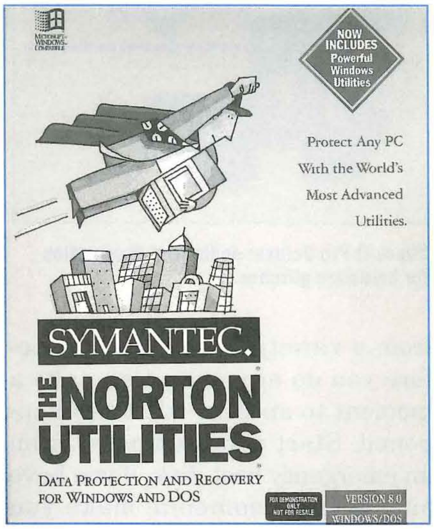
The DOS and Windows file system is inherently fragile. A bug in an application program, a power glitch at the wrong time, switching off the computer before returning to the DOS prompt, and it collapses like a house of cards. That's why backups are so important, and why file-rescue utilities are so popular.

Normally, your PC works just fine. Your files and programs sit safely on the hard disk until you need them, loading into memory without a hitch. But catastrophes are always lurking in the background: Files may disappear, data from one file may end up in another, subdirectories may show up in the wrong directories, and so on.

Luckily, disasters don't happen often, but if you know how to handle them when they do, they can turn out to be minor annoyances instead of full-blown, hair-pulling, screaming-at-the-dog catastrophes. The first step is to stop computing as soon as you notice trouble. If you try to save new files, you may overwrite data belonging to files you want to recover. Just stop, look at the damage, and think.

Above all, *don't* run DOS's RECOVER command, which was part of DOS 5 but destroyed so much data that Microsoft dropped it completely from DOS 6. (If you still have a copy of RECOVER.EXE in your DOS directory, erase it.) *Don't* run CHKDSK with the /F (fix it) option, and *don't* try to recreate missing files or directories on your own. Instead, reach for either Central Point's **PC Tools Pro 9.0** or Symantec's **The Norton Utilities 8.0**. Of the two, I prefer the Norton package, but either will do.

Both products include extensive sections explaining how to recover


NOW INCLUDES Powerful Windows Utilities
Protect Any PC With the World's Most Advanced Utilities.
SYMANTEC.
THE NORTON UTILITIES
DATA PROTECTION AND RECOVERY FOR WINDOWS AND DOS
FOR DEMONSTRATION ONLY NOT FOR RESALE
VERSION 8.0
WINDOWS/DOS

**The Norton Utilities: damage control for a variety of computing crises.**

DOS TIP

## SUPPRESSING OUTPUT IN BATCH FILES

You don't have to be secretive to want to hide certain batch-program output. For example, if you let DOS display information such as COPY's "*x* file(s) copied" message, not only do you run the risk of confusing a novice user, but you also clutter up the screen. In many cases, you may redirect the unwanted output of a DOS command to the NUL device, but that doesn't always work.

For example, problems may arise if you use this batch program, named PURGE.BAT, to delete the backup files created by an editor:

```
DEL *.BAK
```

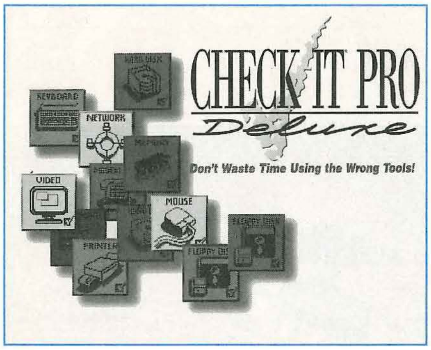
If DEL finds files with the extension BAK, it deletes them without displaying any information on screen. But if no BAK files exist, DEL displays a "File not found" message. Redirecting the output of the command to the NUL device doesn't work, because with error messages, DOS ignores redirection and writes its notes to the console device (your screen).

You can eliminate this difficulty by using the CTTY command to change the default console device to NUL, inserting the command you want to carry out, then restoring the normal console setting. The following batch file suppresses all error messages:

```
@CTTY NUL
DEL *.BAK
CTTY CON
```

Note that after you execute the CTTY NUL command, your PC won't display anything on screen or respond to the keyboard. So be sure that the commands that follow require no input from the keyboard; otherwise, you'll have to reboot your PC. Likewise, if you type `CTTY NUL` at the DOS prompt, you'll have to reboot your system to regain control.

—Robert L. Hummel



**Check It Pro Deluxe: dedicated diagnostics for hardware glitches.**

from a variety of disasters, so before you do anything else, take a moment to analyze what has happened. Start your computer from an emergency boot disk, if you have one, or have someone make you one on another computer.

All you need is to be able to boot from the floppy and take a look around with DIR. Can you access your hard drive? Has DOS formatted it accidentally? Can you see files in some directories but not in others?

Once you have an idea of the damage, the next step is to read carefully the manual that came with your recovery tools. Follow the instructions to the letter. Both The Norton Utilities and PC Tools Pro come with disks that let you run their recovery tools without loading them onto your hard disk, so you may be able to get back on your feet without overwriting any of your data.

I can't describe the exact steps you should go through to repair your files, because that depends on the particular kind of damage that has occurred. Both PC Tools Pro and The Norton Utilities lead you step by step through the recovery process that will have the best chance of working on your system. Just be sure to follow directions. This is one time when "I wonder what this option does?" is curiosity that can kill your data.

If you plan ahead, the entire process will be much easier. You'll need a recovery disk and a recent backup of your system. Either package described here can help you make a recovery disk, and PC Tools Pro also includes a powerful backup program that works with floppy disks and most tape-backup units.

### Hardware Blues

If you're like me, you tend to take our PC's hardware for granted. The CPU and the RAM magically perform their jobs, the correct characters appear on screen when you type, the mouse moves a pointer, the serial and parallel ports send and receive data when necessary, sound comes through the speakers, and CD-ROM data and images appear on screen. It all works great—until something breaks, or you have to install a new card or device.

But tomorrow or the next day, your normally reliable machine may suddenly become a disaster area. Whether you face a hardware problem or installation of a new card, you'll need a diagnostic program.

Both DOS and Windows include Microsoft's own diagnostic program, MSD. Both The Norton Utilities and PC Tools Pro include diagnostic programs. Any of these programs is valuable and a good first step—any one of them may help you solve your problem or resolve a conflict when installing a new board.

But none is as thorough as a dedicated diagnostic package. That's why Touchstone's **Check It Pro Deluxe 2.0**, even though it hasn't been upgraded recently, is part of my computer's first-aid kit.

On one occasion, my PC had a failing memory chip. Sometimes I'd see a report of a memory-parity error; the computer would lock up, and I'd have to reboot and lose the data on which I was working. I used Check It Pro to test the memory continuously until a failure occurred. I eventually found the flaky SIMM (single in-line memory module) and replaced it. Since then, the parity errors have disappeared completely.

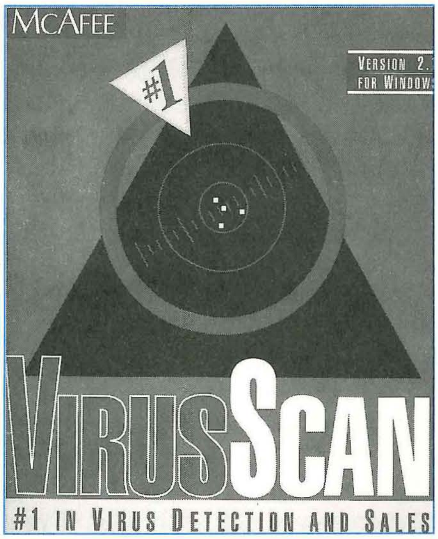
When one of our printers started acting up, I used Check It Pro to first perform complete diagnostics on the parallel port and then on the printer until I isolated the error. My repair bill was much lower because I could tell the technician exactly what was wrong and how to reproduce the problem. Finally, when I had trouble installing a CD-ROM reader, only Check It Pro was able to pinpoint the conflicts that were causing the problem.

Although you'll find several good diagnostic programs on the market, I've relied on various versions of Check It for several years on a number of machines. Whatever diagnostic program you choose, however, the rule to live by is simple: Don't wait to buy one until you have a reason to use it.

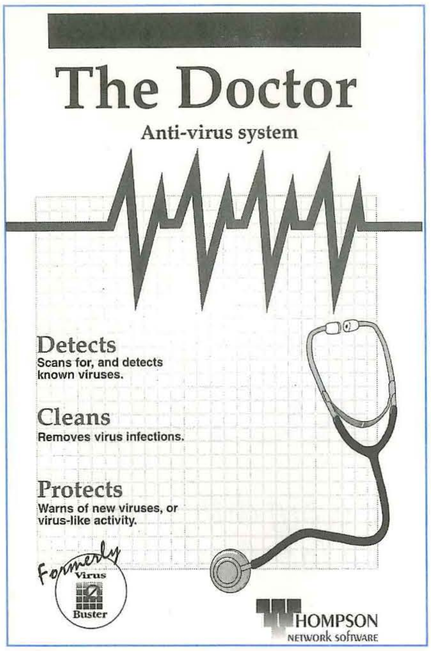
### Computer Diseases

A virus attack certainly ranks as a major computing disaster. In fact, according to the popular press, it's the most common troublemaker of all. In my own experience, however, a virus infection occurs less often than the problems discussed here so far.

Nevertheless, unless you write all your own software with your own compiler, never load any commercial or shareware programs



**VirusScan: regular checkups to ward off nasty system infections.**


The Doctor
Anti-virus system
Detects
Scans for, and detects known viruses.
Cleans
Removes virus infections.
Protects
Warns of new viruses, or virus-like activity.
Formerly
Virus Buster
THOMPSON
NETWORK SOFTWARE

**The Doctor is in: virus detection for standalones, workstations, or network servers.**

into your machine, and never leave a floppy disk in drive A when you boot your system, a virus may attack your computer.

Some viruses are easy to eradicate when they appear; others can wipe out your hard disk before you know they're there. Getting rid of the latter might necessitate rebuilding your system from backups you made before the virus appeared—if you still have them. Usually, it's much easier to wipe out a virus before it has a chance to erupt than to wait for infection to occur.

To keep viruses off your system and clean up any that have already infected it, you'll need two kinds of programs.

A *scan* program, such as DOS 6.x's MSAV, examines your disks, and perhaps the computer's memory, looking for existing viruses. Most scan programs can also erase viruses from infected files or from infected boot sectors of hard disks and floppies.

If you suspect that your computer may be infected by a virus that a scan program can't detect, you can run a *shield* program, such as DOS's VSAFE, which stays in memory and tries to fend off virus activities. Keep in mind, though, that a virus shield uses memory and slows your computer somewhat as it operates. (If you scan new programs and floppy disks before you run them, you probably don't need a shield program.)

The real difficulty is picking a set of virus programs. Most knowledgeable users agree that DOS's MSAV and VSAFE, along with their Windows-based companions, are among the weakest on the market. On top of that, most users neglect to update MSAV so that it will recognize newly discovered viruses. The moral of the antivirus story is this: If you're concerned about viruses, don't use MSAV.

For an alternative, check out Central Point's virus checker, included in PC Tools Pro. Meanwhile, some users insist that your computer will be safer if you use **The Norton AntiVirus 3.0**, sold separately from The Norton Utilities, or McAfee's **VirusScan** for DOS or Windows. I've used VirusScan for years, and my computers have never suffered an infection, but, of course, many users who never run an antivirus program can make the same claim.

Once you select an antivirus program for your first-aid kit, you'll need to scan every new program before you run it: on the distribution disk, on CD-ROM, or in its downloaded form.

Many advanced virus checkers can look within ZIP and other compressed files for viruses, so you don't even have to unzip a program to check for viruses.

In addition, make sure you update the program or its signature list regularly, usually via an online service or BBS. (You may have to pay a modest fee to receive updates by mail.)

Be aware, though, that an out-of-date antivirus program may be worse than none at all, because it will undoubtedly give you a false sense of security and will also miss newly invented viruses. ■

## BUYER'S GUIDE SAMPLER

**Check It Pro Deluxe 2.0, $249.95**
Touchstone Software Corp.
2124 Main Street
Suite 250
Huntington Beach, CA 92648
800-531-0450

**The Doctor Antivirus System, $300**
Thompson Network Software Inc.
P.O. Box 669306
Marietta, GA 30066-0106
404-971-8900

**Micro-Scope 6.0, $499**
Micro 2000 Inc.
1100 East Broadway
Suite 301
Glendale, CA 91205
800-864-8008

**The Norton AntiVirus 3.0, $99.95**
**The Norton Utilities 8.0, $99.95**
Symantec Corp.
175 West Broadway
Eugene, OR 97401
800-441-7234

**PC Tools Pro 9.0, $99**
Central Point Software
15220 N.W. Greenbrier Parkway
Suite 200
Beaverton, OR 97006
800-445-4208

**SpinRite 3.1, $89**
Gibson Research Corp.
35 Journey
Aliso Viejo, CA 92656
800-736-0637

**VirusScan, $65 single-user 2-year license**
McAfee Associates
2710 Walsh Avenue
Santa Clara, CA 95051
408-988-3832

HIGH-SPEED MODEMS

# Burning Rubber Or Blowing Smoke?

*Someday soon, those speedy 28.8kbps modems could make a big difference in your on-line travels. Let's look under the hood to separate fact from hype.*

by Robert L. Hummel

Pick up any computer magazine and the hot topic always seems to be one of the many on-line services, bulletin-board systems, or Internet forums you can access these days. Without fail, these articles paint a picture of the on-line world as exciting, packed with entertainment, and even offering a shot at romance. In many ways, they make going on line sound more like taking a Caribbean cruise than using your PC.

If you're living with a slow modem left over from the PC's Paleolithic era—or no modem at all—then you're probably worrying that you're missing out on the on-line revolution. But are you? There's lots to consider before you rush to merge onto the information highway, especially with a new high-speed modem.

## It's Still a Slow-Motion World

Although hyperfast communications sounds great, most of the world isn't up to speed. True, the new 28.8kbps (28,800 bits per second) whiz kids will one day soon dominate the phone lines when it comes to downloading massive text and graphics from the information highway, but that's still a standard with which the marketplace has yet to catch up. (See the accompanying sidebar, "Watch Your Speed," page 52.)

At press time, for example, CompuServe was offering only ten 28.8kbps access points in the entire United States. So until everyone starts using a V.34 device, compatibility with older, slower standards (the prevailing V.32bis/14.4kbps and V.32/9600-bps standards) must be your primary consideration when shopping for a modem.

In addition, if you anticipate having to connect with much older systems, you'll also have to look for V.22bis (2400 bps), V.22 (1200 bps), and V.21 (300 bps) support. But wait, there's more: Before the V.34 standard was finalized, many manufacturers produced modems using the so-called V.FC standard. A V.FC can't connect to a V.34 at 28.8kbps. If you want to communicate with V.FC modems at high speeds, yours must support the V.FC standard explicitly.

As you can see, buying a high-speed modem this early in the technology can be complicated. But to make it simpler, we'll take a comparative look at three of the latest 28.8kbps models, explain what goes into a speedy modem (and also what's sometimes left out), and list the important features to look for.

## The Chips Are on the Table

Let's get to the best part first. Even with higher performance, modem prices are steadily dropping. Sure, you can pay up to $1000, but you can also get one of several quality 28.8kbps models for less than $200. Lower prices are partly the result of the wide availability of inexpensive chip sets produced by manufacturers such as Rockwell, Sierra, and AT&T. Other manufacturers, such as U.S. Robotics and Motorola, have created their own custom chip sets, which generally provide nearly all the complex data

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*Contributing Editor Robert L. Hummel is the author of* PC Magazine Programmer's Technical Reference: The Processor and Coprocessor, PC Magazine Assembly Language Lab Notes, *and* Programmer's Technical Reference: Data and Fax Communications *(all from Ziff-Davis Press, 1992).*

handling, modulation, and interface requirements necessary for a high-speed modem.

The natural question that arises is "Why do two modems offering the same speed and capabilities differ in price by hundreds of dollars?" As the expression goes, the devil is in the details.

The underlying chip set is really only a small part of a modem's overall price. Building an inexpensive modem means cutting costs elsewhere—in other words, sacrificing features. It's the same as comparing a "stripped-down" version of a new car to its "loaded" twin. Fortunately, many of the high-end features—fancy displays, comprehensive manuals, slick packaging, instant upgradability via flash ROM, leased-line support, elaborate security measures—won't affect your ability to communicate.

The real difference between any great modem and a poor one lies in the circuitry. Establishing and maintaining a connection at high speed requires that the modem be able to detect and compensate for the many anomalies on the phone line that can degrade its signal. Doing so requires extra circuitry, and that increases the modem's cost as much as it enhances operation.

Slower, no-name modems often save money by omitting this crucial circuitry. As a result, they may connect reliably at their highest speed only when phone conditions are perfect—in other words, almost never. Add the least bit of noise or static, and these bargain-basement specials may fail to connect at all or may drop to dreadfully slow speeds to establish a connection.

Another area in which modem manufacturers shave costs is by not implementing the full set of communications standards. The standards describing modem operation (called V.$x$, where $x$ is the standard number) provide the details that let two modems talk to each other. A modem that supports all optional protocols has the best chance of establishing a reliable connection and of establishing it at the highest possible speed.

### An Inny or an Outty?

You can always choose a good modem, no matter what its speed, based solely on its technical merits. But finding the one best suited to your needs will also mean considering its physical form, capability, compatibility, and options.

*Internal* modems are popular because they install inside your PC and require no desk space, no external power supply, and no cables—an advantage for crowded desktops.

But an internal modem also requires that your PC have a free expansion slot—something not always available in today's crowded systems. Adding an internal modem to an existing system means that you'll have to physically open up your PC.

Although an internal modem doesn't connect to a serial port, it looks like one to your PC. At the very least, you'll have to configure the modem to use a free COM-port address. At worst, you may have to disable an existing COM port or set your modem to a nonstandard configuration. (The installation manual usually provides a detailed description of how to do that.)

An *external* modem, on the other hand, functions as a stand-alone peripheral and provides its own power supply (usually a wall transformer). You must connect it to your PC with a serial cable, an item you'll probably have to purchase separately. Adding an external modem means that you've got to have a free COM port. If you're already using a serial mouse and a

## BAUD RATE VS. BIT RATE: WHAT'S THE DIFF?

The terms *baud rate* and *bit rate* (*bps*, or *bits per second*) are often used interchangeably, but they're hardly the same thing. Each describe fundamentally different properties of the communications channel.

A communications channel's baud is an expression of its primary electrical signaling rate: that is, the number of potential line conditions that may occur in the channel per unit of time. As such, baud is a physical characteristic of the signal itself, and bears no fixed relationship to the amount of data being transmitted by the signal. Each potential condition change is called a *symbol* or *event*, and a channel's baud is expressed in symbols per second (symbols/sec); 1 baud = 1 symbol/sec.

In contrast, a channel's bit rate is the number of bits of information the channel can carry, expressed in bits/sec, or bps. The bit rate takes into account factors such as data compression and error correction; unlike baud, a single symbol may represent more than 1 bit.

For example, consider a modulation scheme that defines four possible line conditions for a single symbol. Each one is then assigned to one of the four possible combinations of a pair of bits. Using this encoding scheme, a 600-baud channel would be able to carry 2400 bits/sec. Similarly, a system that defined 16 symbol conditions could encode 4 bits/symbol and achieve a bit rate of 9600 bits/sec over the same channel. A channel's baud is numerically equal to its bit rate only when 1 bit per symbol is encoded.

**—R.H.**

serial printer, you may have to add a new serial-port board, so make sure you still have a free slot inside your PC.

One big advantage of an external modem is that you can see its display, which can communicate information such as whether you're connected, your connection speed, and modem status. If communications problems develop, an external modem can make testing easier, because you can move it easily to another system or replace it with a working modem to test your PC and software.

Functionally, an external modem is identical to its internal counterpart. The external modem may be easier to install and is more portable, but because an internal modem lacks the case, power supply, display unit, serial interface, and other hardware required by an external unit, it tends to be less expensive.

## Can I Have That in Writing?

A few years ago, modems that could communicate with fax machines were unique and expensive. Today, fax support is nearly universal and adds no real cost to a modem. Your current plans may not include using your PC to send and receive faxes, but you'll want to be prepared if those plans change; if you're considering a 28.8kbps modem, it's important that it support faxing.

Unlike a stand-alone fax machine, which takes all responsibility for sending and receiving faxes, a fax modem shares the job with the PC. The Electronic Industries Association (EIA) has created specifications for fax modems defining where this separation occurs and establishing the details of the interface.

A modem that supports EIA Class 1 fax commands provides the minimum services necessary to send and receive faxes. A software application always manages the fax session.

Class 2 fax modems contain a good deal more intelligence; most of the session's work is performed not by the PC, but by the Class 2 modem. A Class 2 modem can also provide better performance in a multitasking environment.

The command set controlling a Class 2 modem isn't upwardly compatible with Class 1. A Class 2 modem may or may not understand Class 1 commands, so before buying a Class 2-only modem, make sure your fax software supports it.

A Class 3 fax-modem standard is currently under study. It's likely that Class 3 modems will accept some form of TIFF (tagged image file format) graphics and ASCII (text) files for conversion, in addition to meeting Class 2 requirements. It's expected that a Class 3 modem will be able to expand any image it receives.

## High-Speed Advantage

Still got your eye on one of those 28.8kbps modems? Okay, let's get down to specifics. All high-speed modems conforming to the V.34 specification provide the same basic communications capability. In many cases, though, a particular modem's suite of options makes that model better than another for your personal application:

- **Distinctive Ring.** For most of us, installing separate phone lines for voice, data, and fax is an expensive luxury. To make one phone line do double or even triple duty, you can take advantage of a phone-company service called Distinctive Ring. (Your phone company may use a different name, such as RingMate, Smart Ring, or RingMaster.) Using Distinctive Ring, up to two additional phone numbers are assigned to the same line. But, depending on the number dialed, the phone's bell will ring once, twice, or three times each cycle. After activating Distinctive Ring, you can give out separate numbers for voice, data, and fax. For example, you can assign a single ring to your voice line and a double ring to your fax line. You can then set up your communications software, which must support Distinctive Ring, to answer only the double ring. The result is that calls are connected to the right place automatically.

- **Caller ID.** Another option your phone company may offer is Caller ID (also called *caller-number delivery*). Although you probably think of Caller ID as a way to screen calls

## THE BASICS AND BEYOND

Everything you've ever wanted to know about modeming, without going to technical school, can be found in the second edition of a book from Osborne/McGraw-Hill: ***Modems Made Easy***, by on-line maven David Hakala. The Internet craze, coupled with technological advances since the first edition was published in 1993, have prompted the update. As the author puts it, *Modems Made Easy* is "for people who want to get on line and have fun, without worrying about what their modem is doing. Technophiles who delight in learning the microscopic details of how things work will be better served by other books."

Beginning with the whimsical "Why Millions of Otherwise Normal People Use Modems," the book entertains while thoroughly indoctrinating readers with practical tips on setup, software installation, starting your own BBS, and even "Money-Saving Ideas for Modem Maniacs." Substantial coverage is also devoted to getting on and using the Internet, including how to (carefully!) market your goods or services on the Net.

Readers can purchase two optional companion disks offering current versions of modem-related shareware, directories of special-interest BBSes, Internet host sites and access providers, and World Wide Web home pages.

***Modems Made Easy****, $21.95; Osborne/McGraw-Hill, 2600 Tenth Street, Berkeley, CA 94710; (510) 549-6600.*

**—Steven F. Smith**

and keep track of who called when you were out, it can also be a powerful business tool. For example, businesses use contact-management software to track customers, orders, and other information; smart contact-management software can monitor a Caller ID-equipped modem, retrieve the number of the calling customer, and automatically open up the account information for that customer. If your business involves extensive customer contact over the telephone, you may find Caller ID support a valuable option.

- **Flash memory.** Flash memory is often touted as an extra-cost option. It simply means that you can upgrade the modem's internal workings (to fix bugs or add new capabilities) without opening up the modem or replacing its ROM chips. In the past, flash memory wasn't an attractive option; by the time you got around to upgrading, a newer and faster standard had made your modem obsolete. But the V.34 standard pushes speeds about as high as they can get over ordinary phone lines; V.34 may be the last standard you'll see for modems until the entire country goes digital. As a result, investing in flash memory to allow painless upgrades may be worthwhile.

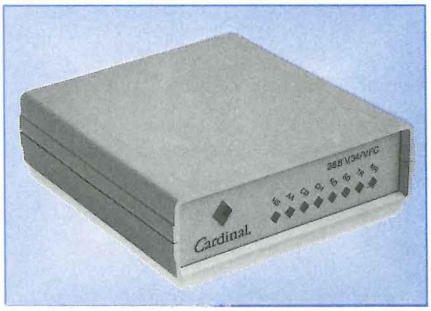
## Let's Go Shopping

To give you an idea of what's available in the 28.8kbps marketplace, we looked at three representative modems: a bargain type, one that's middle of the road, and a luxury vehicle. Each of these three external modems supports the full V.34 specification and offers compatibility with V.32bis, V.32, V.22bis, V.22, V.21, and other international standards, providing communications speeds of 300 bps to 28,800 bps. All support V.42 and MNP 4 error detection and V.42bis and MNP 5 data compression, as well as Class 1 fax compatibility at speeds of up to 14,400 bps.

The documentation for each device includes installation instructions, a reference section describing the modem's command set, and a troubleshooting guide. Each package includes a modular phone cord to connect the modem to the phone line, a phone jack to let an ordinary phone share the line, and an external power transformer. None of these modem packages, though, includes a serial cable to connect the modem to the PC. (See the accompanying table, "Comparison Shopping," page 52, for a summary of each device's features.)

In my tests, each of the modems proved easy to hook up and operate. In general, initialization strings for modems tend to vary slightly, so be sure to read the documentation carefully if you decide to upgrade.

**Cardinal MVP288XF, $189**
Cardinal Technologies, Inc.
1827 Freedom Road
Lancaster, PA 17601
717-293-3124



Dollar value and flexibility, all in one package.

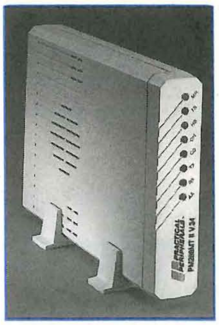
The Cardinal modem is the most affordable of the three 28.8kbps models reviewed here. In addition to compatibility with the current V.34 standard, the Cardinal offers compatibility with existing nonstandard V.FC modems—flexibility that will give you greatest chance of connecting at high speed with online services. The Cardinal modem also supports Class 2 fax operation.

The package includes COMit for Windows (a communications program) and FaxWorks for Windows (fax software), but no DOS-based software. Cardinal offers a limited lifetime warranty on this model, but tech support is a toll call.

**Practical Peripherals PM288MT II V.34, $379**
Practical Peripherals, Inc.
375 Conejo Ridge Avenue
Thousand Oaks, CA 91361
805-497-4774

Practical Peripherals' 28.8kbps modem represents the midrange of the cost spectrum, but in many ways is nearly indistinguishable from the Cardinal modem. Both are built around similar Rockwell chip sets and offer corresponding features, including V.FC and Class 2 fax compatibility.

The Practical Peripherals modem, however, comes bundled with QuickLink II, an integrated data and fax communications package for DOS and Windows. The company offers a limited lifetime warranty, but tech support is a toll call.

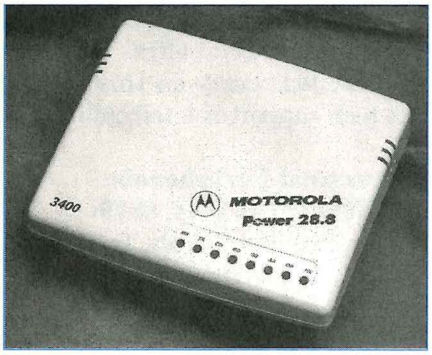


Free QuickLink II software included.

**Motorola 3400 Power 28.8 PC, $895**
Motorola, Inc.
5000 Bradford Drive
Huntsville, AL 35805
800-365-6456

The Motorola modem's high list price might lead you to believe that it offers many more features than the others. If so, you'd be only half right. The Motorola 3400 Power 28.8, based on the company's proprietary chip set, lacks the V.FC compatibility characteristic of Rockwell-based modems. And although it supports Class 1 fax commands, it doesn't understand Class 2.

But the Motorola does include several advanced features the less



**Hundreds more, but check out its feature set.**

expensive modems don't offer, including support for Caller ID and Distinctive Ring.

When I put the Power 28.8 through its paces, however, it generated a high level of electromagnetic interference (EMI), and even after I attached a suppressor (included in the package) to the power cord, interference with a nearby radio was evident.

It features the same DOS and Windows versions of QuickLink offered by the Practical Peripherals modem. And although Motorola's warranty is for just five years, it's the only manufacturer of the three to offer a toll-free tech-support line.

## Speedy Payback, Someday

If you're still trying to make up your mind about buying a 28.8kbps modem, now or later, consider this final nugget: Everyone wants something for nothing, but if you spend a significant amount of time on line, a hyperspeed modem could one day save you a considerable sum in connect costs.

Let's assume that you'll be spending about two hours a day surfing the World Wide Web on the Internet at a cost of $3 per hour and that your current modem is an old 2400-bps model that came with your PC. You spend $200 on a new 28.8kbps modem. When the marketplace catches up to the V.34/28.8kbps standard, how long will it take you to save that $200 in connect charges?

First, note that your new modem is 12 times faster than the old one (28,800 divided by 2400 equals 12). So for every hour you were logged on at 2400 bps, connecting at 28,800 bps will save you 55 minutes. Saving 110 minutes ($5.50) a day, you'll earn back your $200 in about five weeks.

Well, at least in theory. This example assumes that your modem will be transmitting data at its top rate during the entire time you're on line. And at low modem speeds, such as 2400 bps, that may be true. But if you're connected at 28,800 bps, odds are that you'll spend more time waiting for the host system to respond. And because your modem response is peppier (making your on-line experience more enjoyable), you'll probably spend even more time on line than before!

Nevertheless, it's clear that a speedier modem will make downloading faster, saving you time and money. Sooner or later, that is. ■

## COMPARISON SHOPPING

| | Cardinal | Practical | Motorola |
|---|---|---|---|
| Class 1 fax | Y | Y | Y |
| Class 2 fax | Y | Y | N |
| V.FC support | Y | Y | N |
| Caller ID support | N | N | Y |
| Distinctive ring | N | N | Y |
| Flash ROM upgrades | N | N | N |
| Toll-free tech support | N | N | Y |
| DOS comm software | N | Y | Y |
| DOS fax software | N | Y | Y |
| Windows comm software | Y | Y | Y |
| Windows fax software | Y | Y | Y |
| Warranty | lifetime | lifetime | 5-year |

# WATCH YOUR SPEED

Here's a question you have to ask: "Is V.34 for real?" The answer is "Seldom yes, often no." Here's why.

Even though phone companies have upgraded their long-distance and trunk lines to optical-fiber links, you still have to reach out across aging copper cables at both ends of any connection. Though the speed limit may be astronomical in the middle, you'll have to pull out of the fast lane to get from the local switch to your house and then from the destination switch to the access provider.

It's rare to make 28.8kbps connections via V.34; 14.4kbps is often the best speed copper phone lines can support. On-line research in the Internet's Usenet newsgroup **comp.dcom.modems** led me to observe that average transfer rates are more likely to be 20 or 22kbps, rather than 28.8kbps, because of problems with local loops.

So should you buy a V.34 modem (or a faster one, when it's available)? Only if you're reasonably sure you can benefit from the increased speed. Talk to your on-line access provider. If some of its users can run at transfer rates higher than 14.4kbps, going for a V.34 might be worth it. If not, stick with a good-quality V.32 modem (with throughput of up to 57.6kbps using V.42bis). You'll save money, and you won't end up buying capabilities you can't use.

When digital phone lines (ISDN) become commonplace by the end of the century, you won't have to put up with the eccentricities of analog communications anymore. You'll be able to get clean transfer rates of 64 and 128kbps at more affordable prices.

Today, however, you're looking at equipment costs of $400 to $1000 and monthly service fees of $100 and higher.

**—Ed Tittel**

## DOS WORLD

# Readers' Queue

### Work Time

I used to have difficulty tracking the amount of time I spent working on projects. If I even remembered to write down start and stop times, I lost the paper. But rather than pay out $100 or more for project-management software, I spent a few hours developing three QBasic programs and a batch file that let me track how long I work.

The first program, TIME1.BAS (right), asks for the name of your current project (up to eight characters). The program adds the extension PRO; a PRO file is a temporary holding place for the current project name, as well as the current time and date.

TIME2.BAS (page 54, left) kicks in when you exit the application for which you're logging work hours. It reads the appropriate file—PROJECT.PRO, in this case. If you haven't assigned a project file with the extension TME to your current work, TIME2.BAS creates one. If a TME file exists, TIME2.BAS adds the current time and date to it. TIME3.BAS (page 54, right) reads all this information, adds up the time spent on a project, and generates a report.

The batch file is the glue that holds the three QBasic listings together. Its contents vary according to the application for which you're tracking hours and the directory in which you want your project files to reside. For instance, if you want to track how long you work in Windows and you store your TME files in C:\DOS, your batch file, called T_WIN.BAT here, will look like this:

```
CD \DOS
QBASIC /RUN TIME1.BAS
CD \WINDOWS
WIN
CD \DOS
QBASIC /RUN TIME2.BAS
```

When you want to see how much time you spent working in a program, load QBasic and run TIME3.BAS. Press S to print to screen or P for printer.

You can create as many files as your hard disk can hold; their length also depends only on available memory and disk space. Note that you must exit your program appropriately; if you just turn off your computer while still in the program, you won't record your work time.

*Herbert E. Jackson*
*Danvers, Massachusetts*

**TIME1.BAS creates a new project file or adds to an existing one.**

```
DECLARE FUNCTION JULIAN& (YEAR%, MONTH%, DAY%)
'
START:
CLS : LOCATE 10, 10: INPUT "Project Name ", PNAME$
IF PNAME$ = "" THEN GOTO START

'Check length of filename;
'remove extensions added by mistake.
IF LEN(PNAME$) > 8 THEN PNAME$ = LEFT$(PNAME$, 8)
DOT = INSTR(PNAME$, "."): IF DOT > 0 THEN PNAME$
  = LEFT$(PNAME$, DOT - 1)

'Add extension to PNAME$
'and set up proper directory.
PNAME$ = PNAME$ + ".TME"
DIRNAME$ = "C:\DOS\" + PNAME$
DIRPROJ$ = "C:\DOS\PROJECT.PRO"
'
'Get current time;
'break out hours, minutes, and seconds.
T$ = TIME$
HOURS = VAL(LEFT$(T$, 2))
MINUTES = VAL(MID$(T$, 4, 5))
SECONDS = VAL(RIGHT$(T$, 2))
'
'Get today's date
'and break out month, day, and year.
TODAY$ = DATE$
YEAR% = VAL(RIGHT$(TODAY$, 4))
MONTH% = VAL(LEFT$(TODAY$, 2))
DAY% = VAL(MID$(TODAY$, 4, 5))
STARTDAY& = JULIAN&(YEAR%, MONTH%, DAY%)
'
'Turn hours and minutes to seconds.
HOURS = HOURS * 3600
MINUTES = MINUTES * 60
TOTALSEC = HOURS + MINUTES + SECONDS

'Open and save the file.
OPEN DIRPROJ$ FOR OUTPUT AS #1
PRINT #1, DIRNAME$
PRINT #1, TODAY$
PRINT #1, T$
PRINT #1, TOTALSEC
PRINT #1, STARTDAY&
CLOSE #1
SYSTEM

FUNCTION JULIAN& (YEAR%, MONTH%, DAY%)
Y& = YEAR%: M& = MONTH%: D& = DAY%
TEMP& = (M& - 14) \ 12
J& = D& - 32075 + (1461 * (Y& + 4800 + TEMP&) \ 4)
J& = J& + (367 * (M& - 2 - TEMP& * 12) \ 12)
JULIAN& = J& - (3 * ((Y& + 4900 + TEMP&) \ 100 \ 4))
END FUNCTION
```

*End*

**TIME2.BAS adds date and time information to a file after you exit a program.**

```
DECLARE FUNCTION JULIAN& (YEAR%, MONTH%, DAY%)

CLS
OPEN "C:\DOS\PROJECT.PRO" FOR INPUT AS #1
INPUT #1, N$
INPUT #1, STARTDATE$
INPUT #1, STARTTIME$
INPUT #1, STARTSECONDS
INPUT #1, STARTDAY&
CLOSE #1
'
TODAY$ = DATE$
T$ = TIME$
HOURS = VAL(LEFT$(T$, 2))
MINUTES = VAL(MID$(T$, 4, 5))
SECONDS = VAL(RIGHT$(T$, 2))
'
'Add days?
YEAR% = VAL(RIGHT$(TODAY$, 4))
MONTH% = VAL(LEFT$(TODAY$, 2))
DAY% = VAL(MID$(TODAY$, 4, 5))
ENDDAY& = JULIAN&(YEAR%, MONTH%, DAY%)
ADDDAY& = ENDDAY& - STARTDAY&
IF ADDDAY& > 0 THEN HOURS = HOURS + (ADDDAY& * 24)
'
'Figure new ending seconds.
TT = HOURS * 60:
MM = (TT + MINUTES) * 60
SS = (MM + SECONDS)
'
'Break out and figure the time worked.
SSS = SS - STARTSECONDS
NEWHOUR = INT(SSS / 3600):
'
NEWMIN1 = (NEWHOUR * 3600)
NEWMIN2 = SSS - NEWMIN1
NEWMIN3 = INT(NEWMIN2 / 60)
'
NEWSEC1 = (NEWMIN3 * 60)
NEWSEC2 = (NEWMIN2 - NEWSEC1)
T1$ = STR$(NEWHOUR):
T2$ = STR$(NEWMIN3): T2$ = RIGHT$(T2$, 2)
T3$ = STR$(NEWSEC2): T3$ = RIGHT$(T3$, 2)

WORKED$ = T1$ + ":" + T2$ + ":" + T3$
OPEN N$ FOR APPEND AS #1
PRINT #1, STARTDATE$, STARTTIME$, TODAY$, T$, WORKED$
PRINT #1, NEWHOUR
PRINT #1, NEWMIN3
PRINT #1, NEWSEC2

CLOSE #1
SYSTEM

FUNCTION JULIAN& (YEAR%, MONTH%, DAY%)
Y& = YEAR%
M& = MONTH%
D& = DAY%
TEMP& = (M& - 14) \ 12
J& = D& - 32075 + (1461 * (Y& + 4800 + TEMP&) \ 4)
J& = J& + (367 * (M& - 2 - TEMP& * 12) \ 12)
JULIAN& = J& - (3 * ((Y& + 4900 + TEMP&) \ 100 \ 4))

END FUNCTION
```

*End*

**TIME3.BAS computes the total number of hours worked and sends a report to the screen or a printer.**

```
CLS : LOCATE 10, 10: INPUT "Project Name ", PNAME$
'
'Check length of filename;
'remove any extensions added by mistake.

IF LEN(PNAME$) > 8 THEN PNAME$ = LEFT$(PNAME$, 8)
DOT = INSTR(PNAME$, "."): IF DOT > 0 THEN PNAME$ =
  LEFT$(PNAME$, DOT - 1)
'
'Add extension to PNAME$
'and set up proper directory.
'NOTE: Change path to match the directory
'in which file is stored.

PNAME$ = PNAME$ + ".TME"
DIRNAME$ = "C:\DOS\" + PNAME$
'
'Print file to the screen or printer.
PRINTOUT:
CLS : LOCATE 10, 10
INPUT "Print to   1 screen   2 printer "; A$
IF A$ < "1" OR A$ > "2" THEN GOTO PRINTOUT
IF A$ = "1" THEN OPEN "SCRN:" FOR OUTPUT AS #2
IF A$ = "2" THEN OPEN "LPT1:" FOR OUTPUT AS #2
PRINT #2, PNAME$

'Open the project file and input the information.
OPEN DIRNAME$ FOR INPUT AS #1
CLS : H = 0: M = 0: S = 0
PRINT #2, "Hours worked for "; PNAME$
PRINT #2, "Date Started  Time Started  Date Ended
  Time Ended     Hour:M :S"

DO WHILE EOF(1) = 0
INPUT #1, A$
PRINT #2, A$
INPUT #1, HOURS: H = H + HOURS
INPUT #1, MINUTES: M = M + MINUTES
INPUT #1, SECONDS: S = S + SECONDS
LOOP
SEC = S / 60: SEC1 = (INT(SEC)): SEC2 = SEC -
  SEC1: NEWSEC = CINT(SEC2 * 60)
M = M + SEC1
MIN = M / 60: MIN1 = (INT(MIN)): MIN2 = MIN -
  MIN1: NEWMIN = CINT(MIN2 * 60)
H = H + MIN1
HR = H / 24:  HR1 = (INT(HR)): HR2 = HR - HR1: HH
  = CINT(HR2 * 24)
DAYS = HR1
PRINT TAB(50); "Total "; H; ":"; NEWMIN; ":"; NEWSEC
PRINT #2, DAYS; " Days  "
PRINT #2, HH; " Hours  "
PRINT #2, NEWMIN; " Minutes "
PRINT #2, NEWSEC; " Seconds "

CLOSE #1
SYSTEM
```

*End*

START-UP CLINIC

# Mistakes, Magic Keys, And Memory Fixes

by Jack Nimersheim

Neither PCs nor the people who use them are infallible. Both are capable of making mistakes from time to time. The secret is knowing how to extract yourself from inconvenient—or, in some instances, potentially catastrophic—situations when they arise. In this column, I'll address questions we've received recently on this topic. Some problems are relatively simple; others are fairly involved.

> *Whether you're new to PCs or have years of experience, accidents happen. But they don't have to be disastrous, as long as you know how to get out of trouble.*

## Aborting an "Abort" Message

*Is there any way to override the "Abort, Retry, Fail?" message that DOS displays when you accidentally access an empty disk drive? I realize you can do it from within Windows or the DOS Shell, but, other than digging up a formatted disk and inserting it into the frozen drive, I don't know how to regain use of my computer when working directly from the DOS system prompt. I'm hoping you do.*

*Michael Lasko*
*Eagle River, Alaska*

This is one of the easy ones. DOS displays its "Abort, Retry, Fail?" message whenever it can't complete a requested operation—such as producing a directory listing for a floppy drive in which no disk has been inserted.

The difference between *abort* and *fail* is one of degree. Aborting an operation simply halts execution of the most recently entered command and attempts to return you safely to the DOS system prompt.

DOS won't abort an operation, though, if it determines that doing so may cause additional problems. Should that happen, Fail offers an alternate solution. It tells DOS to perform a cursory analysis of the problem and, if possible, correct it.

In the case of a missing disk, for example, the Fail option ultimately returns a "Fail on INT *xx*" message, where *xx* is the interrupt controlling the specified disk drive. Unfortunately, DOS may also elect to correct this problem by flagging the troublesome drive as invalid, making it unavailable for subsequent operations. (As you probably suspect, selecting Retry tells DOS to attempt executing a command a second time, after you've taken any steps you think appropriate to correct the initial problem.)

The question, therefore, is whether an intermediate step exists between an unsuccessful Abort request and the more drastic Fail option. The answer in this instance is yes. You won't find this solution documented in any DOS manual, but a simple Ctrl+C keystroke breaks the cycle of an "Abort, Retry, Fail?" message generated by a missing disk and returns you safely to the DOS system prompt, without DOS flagging a disk drive as invalid.

The magic Ctrl+C key combination is worth filing away in your own human memory. You can also use it to terminate execution of batch files or interrupt DOS commands such as DIR and DISKCOPY, which often seem to take interminably long to complete.

## Memory Mishaps

*I have both DOS and Windows installed on my IBM-compatible computer. Sometimes, when I'm switching between the two, I get the following message: "Memory Parity Error Detected. System Halted." This didn't* *always happen, so I figure I must have done something to cause it. Can you help me with this system error?*

*Henry D. Sloan*
*Reading, Pennsylvania*

The good news is that you probably didn't do anything to cause your problem. The bad news is that it might indicate a catastrophe waiting to happen. Chances are that one of the RAM chips in your system has started to malfunction.

All computers rely on self-diagnosis to ensure their own reliability. A parity check is one of the most common diagnostic tricks a computer uses to verify its electronic well-being. Stated simply, a parity check determines whether the total number of 1s or 0s in a byte is odd or even. An 8-bit byte containing the binary values 00101100, for example, has an odd parity—that is, it contains an odd number of 0s and 1s. Most systems are set up to use one or the other—odd or even parity—as a default. Memory chips installed in such systems use a special bit to maintain the proper parity if necessary.

Using the example above, a system set up to check for even parity based on 1s, or "on" bits, would set this special bit to 1. Doing so changes the number of "on" bits in the chip to four, thus increasing to an even number the number of bits set to 1. On a system set up for even parity, this chip would pass the parity test, so to speak.

During a parity check, the system monitors RAM to verify that the appropriate parity exists in its memory chips. An odd parity that shows up during a check on a system designed to use even parity, or *vice versa*, generally indicates a faulty memory chip. When the system discovers this disparity (pardon my pun) during a parity check, as appears to be happening in your machine, DOS shuts down the computer automatically, as a safeguard against creating unreliable data—which could happen if the system ever has to use the faulty chip to perform a critical operation.

The best advice I can give you is to take your system to a qualified service technician for a comprehensive test of its memory chips. That way you can replace the faulty chip. Ignoring the message won't make it go away. This is one instance in which an ounce of prevention now can help you avoid a ton of potential problems in the future.

## New Life for Old Systems

*I still own an old 8088 system. I recently upgraded to MS-DOS 6.22 and installed DriveSpace. Although it created additional storage space, it also slowed down my admittedly antiquated machine. Are there any utilities that will help speed up this old clunker?*

*Gary Hetland*
*Fairbanks, Alaska*

Although your options for improving the performance of an 8088-based system are limited, you can add an expanded-memory board and use the additional RAM, along with a program such as DESQView, to emulate multitasking for your DOS applications. If you use several programs when you work, this will eliminate the need to completely close down one application before running a second program.

You could also create a temporary RAM disk in expanded memory, if it's available. Because memory operates much more quickly than a standard disk drive—a mechanical device—a RAM disk greatly speeds up disk operations.

A second way to speed up disk access is by creating a *disk cache*, a temporary buffer in which DOS stores data recently transferred to and from a disk.

Many disk-related operations are repetitive, meaning that the same activity may be performed again almost immediately. DOS first looks into its cache buffer, if one exists, for the code required to perform a requested operation. If DOS finds the code in the cache, it doesn't have to access the disk, thus speeding up performance.

Many utilities, including the popular Norton Utilities from Symantec Corporation, let you create a cache in expanded memory, if it's available. (DOS's own cache program, SmartDrive, doesn't recognize expanded memory, so you'll need a third-party utility to create an efficient cache on an 8088-based system.)

One DOS utility you can use to improve system performance, even on older systems, is Defrag. It seeks out portions of files scattered across various locations on a disk, then gathers them together into contiguous sectors. Defrag reduces the distance a drive's read/write head must travel to access a file, thus speeding up most disk operations. (For details, see "Rev Up Your Hard Disk with Defrag," page 26 in this issue.)

Although all these techniques will noticeably improve the performance of a first-generation 8088 system, you'll be throwing good money after bad, in my opinion. For only a couple of hundred dollars, you can add a new, faster, larger hard-disk drive to your current system. The result of this simple upgrade, which eliminates the need to load DriveSpace, will be much more dramatic than that of any of the procedures outlined above.

You may also want to check into the more comprehensive upgrade of installing a new motherboard. Even a relatively slow (25MHz) 386SX can run circles around an 8088. ■

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*Jack Nimersheim has been using computers and writing about them for 15 years. He's the author of two dozen books on computer-related topics. His newest work,* Windows 95 Revealed *(Random House Electronic Publishing), was released last fall.*

### WINDOWS SEAT

# Give Me My Space

**by Christy Brothers**

Sharing a computer is a lot like living together. One of you wants wallpaper, the other wants paint. One thrives on a cluttered atmosphere, with games and art supplies strewn all about, while the other prefers a neater place.

Considering different tastes and work habits, you'd think it would be impossible for two people to share a computer and remain civil. Windows 95 promises a solution, offering a different desktop for each user, complete with one's own colors, program groups, applications, icons, and settings. But you don't need Windows 95 to create personalized desktops; if you have DOS 6.x, a simple batch file lets users choose whatever desktop setup he or she calls home. (See the accompanying screen shots, page 59.) With this batch file, users can still share programs. You can customize desktops as Work and Play, Kids and Parents, or even Home and Business, as long as you limit the names to eight characters.

*Considering different tastes and work habits, you'd think it would be impossible for two people to share a computer and remain civil.*

## To Each His (or Her) Own

Start by creating a batch file called WIN.BAT, which uses the CHOICE command to prompt you to pick a desktop. When you choose one, Windows utilizes the GRP and INI files stored in each user's \WINDOWS subdirectory to set up a personalized Windows session.

The first step is to open File Manager and click once on your \WINDOWS subdirectory. (If that's not C:\WINDOWS, make the appropriate substitutions in the following directions.) Pull down the File menu and choose Select Files. In the File(s) box, type `*.GRP *.INI`. Choose Select, then close the Select box. All your original GRP (Program Manager group) and INI (program initialization) files are now selected. Select Copy from the File menu, and copy those files to a clean floppy disk.

Next, click once on the file WIN.COM in the \WINDOWS directory to select it. (The GRP and INI files are deselected.) Copy WIN.COM to your floppy disk, renaming it WINEW.COM.

This disk will provide the basis for each new desktop you design and serve as your insurance policy for recovering your current desktop.

Finally, rename the WIN.COM file in your \WINDOWS directory as OLDWIN.COM (for safekeeping).

While you're still in File Manager, select Create Directory, and set up a subdirectory for each user within the \WINDOWS directory; we'll use Judy and Roger as examples, calling their subdirectories C:\WINDOWS\JUDY and C:\WINDOWS\ROGER. Then copy all the files on your "insurance" floppy to each

**ATTENTION**

**WINDOWS USERS**

*If you use Windows regularly, you probably know a few tricks yourself. Or perhaps you've found a better way to do the job described here. This column is your chance to share your techniques with other Windows users. Contact the Windows Editor at* DOS World, *86 Elm Street, Peterborough, NH 03458, or on CompuServe (**75300,2357**) or MCI Mail (**667-4854**).*

subdirectory. Close File Manager and return to Program Manager.

### WIN.BAT Sets You Apart

Now open Notepad (or any ASCII text editor) and type in the batch file (excluding line numbers) shown in the accompanying program listing, WIN.BAT (opposite). Substitute the names you've chosen for your subdirectories for Roger's and Judy's names. And make sure you save this batch file as WIN.BAT in a directory in your PATH. Once you set it up, whenever you type `WIN` at the DOS prompt or whenever your AUTOEXEC.BAT file starts Windows, you can choose which desktop you want to run.

Lines 7 through 9 assign the letters A, B, and C to the three possible choices. Line 11 uses the CHOICE command (available in DOS 6.0 and later) and /C: to tell the batch file which keys are allowed. It also prompts the user to choose an option.

An IF...THEN situation is set up in lines 12, 13, and 14, so that choosing A, B, or C will bring about the appropriate action—in this case, the processing of an ERRORLEVEL.

Choice A returns an ERRORLEVEL of 1, B returns an ERRORLEVEL of 2, and so on, sending you to the label End, to Roger, or to Judy. SET NAME=, used in lines 17 and 21, creates an environment variable called NAME, which the batch file uses several times.

In the :RUN section, lines 26, 27, and 28 tell your computer to copy the GRP and INI files and WINEW.COM to the current directory (C:\WINDOWS). The redirection sign and the NUL prevent COPY from displaying the name of each file as it's copied. Line 29 runs WINEW.COM with all the switches normally used in your Windows bootup. Windows will open with the personal desktop you've chosen.

Line 30 appears on screen whenever you leave Windows; it indicates that it's saving your personal Windows desktop for you. Lines 31, 32, and 33 copy your GRP and INI files and WINEW.COM back into your personal subdirectory, without displaying them on screen. Line 33 ensures that if Windows has created a new WIN.COM, it will be copied to your personal subdirectory as WINEW.COM, ready for the next time you open Windows. Line 36 erases any errant WIN.COM from the \WINDOWS directory, so that it doesn't run instead of your WIN.BAT file when you type `WIN` to call up your batch-file menu and Windows.

### Setting Up Shop

At this point you have four (that's right) copies of your original GRP and INI files: one on a floppy disk, the original in C:\WINDOWS, one in C:\WINDOWS\JUDY, and another in C:\WINDOWS\ROGER.

You renamed WIN.COM so that it won't start Windows, but you have three working copies of it called WINEW.COM. Exit Windows and reenter at the DOS prompt by typing `WIN`. Your batch file asks whether you want to bring up the personal desktop Roger or Judy or to return to DOS.

You can now set up Windows to your heart's content. Save your desktop settings by holding down the Shift key while double-clicking on Program Manager's Control icon (the little bar in the box in the upper-left corner of that window). It looks as though nothing's happening, but you're saving your settings to the C:\WINDOWS directory.) Then exit Windows to let your batch file save your settings to your personal directory. Your co-user can then set up his or her desktop however he or she prefers. Remember—you never have to see it.

You can add as many personal desktops as you like, simply by

DOS TIP

## A WINDOW ON ZIP FILES

To ensure that my hard disk doesn't become overcrowded, I use PKZIP to compress unnecessary files and archive them on floppy disks. When I'm working in DOS, I can easily see what's in a compressed file by typing:

```
PKZIP -VN filename.ext | MORE.
```

Viewing compressed files from Windows is just as easy if you lay the proper groundwork. First, create a batch file, called ZIP.BAT, that executes the file-viewing sequence and then pauses:

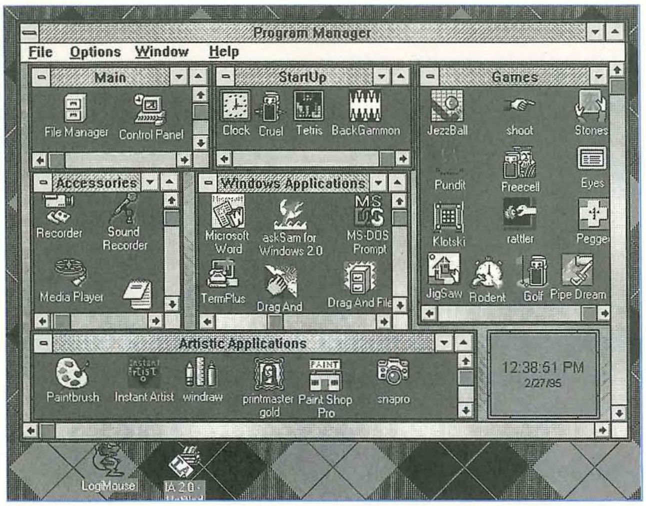
```
@ECHO OFF
PKUNZIP -VN %1 | MORE
PAUSE
```

The PAUSE command is important. If you omit it, the DOS window or session may close before you have a chance to see what's there.

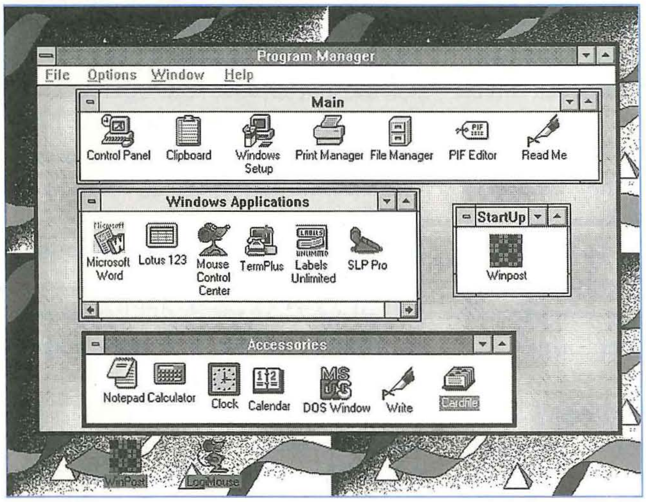
Next, associate the file extension ZIP with ZIP.BAT, so that when you double-click on a ZIP file, ZIP.BAT will execute and load the selected file. To begin, open File Manager, move to a directory containing ZIP files, and highlight any one of them. From the File menu, choose the Associate option, then choose the Browse button to navigate to the directory containing ZIP.BAT. Highlight ZIP.BAT and press Enter or click on the Browse dialog box's OK button. When Windows returns you to the Associate dialog box, click on OK or Enter.

Of course, for ZIP.BAT to work, PKUNZIP must be in the current directory or you must add the directory in which it resides to your PATH statement.

—Frets Olivares



**Multiple desktops (Roger, above; Judy, below) let each user customize his or her own workspace—including wallpaper, colors, fonts, and icon and window arrangement. A simple batch file saves these settings in the users' own directories.**



creating more subdirectories and loading all GRP and INI files and WINEW.COM from your backup floppy disk. Then expand your batch file in the appropriate places. In the first section, add an ECHO statement and a letter for each new desktop, such as `C. Brian`, `D. Susan`. Move RETURN TO DOS to the final statement position in this section.

Add IF ERRORLEVEL statements in the correct (descending) order after the CHOICE line:

```
IF ERRORLEVEL 5 GOTO END
IF ERRORLEVEL 4 GOTO Susan
IF ERRORLEVEL 3 GOTO Brian
```

Include a three-line name statement, in this same order:

```
:Susan
SET NAME=Susan
GOTO RUN
:Brian
SET NAME=Brian
GOTO RUN
```

Then everyone in the family can have a desktop of his or her very own.

### The Way We Were

What if you get nostalgic for the old days? Not to worry. Simply copy the floppy versions of your original GRP and INI files and WINEW.COM back into the \WINDOWS directory, renaming WINEW.COM as WIN.COM. Delete WIN.BAT, and you're back at square one, irritating wallpaper and all. ■

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*Christy Brothers has been working in the on-line community for the past 13 years and has written for a variety of computer magazines. Her current goal is to make life with Windows easier and more productive for herself and her fellow computer users.*

**WIN.BAT lets you choose which desktop to work with under Windows. Line numbers are for reference only; don't type them in.**

```
@ECHO OFF
CLS
C:
CD \WINDOWS
ECHO PERSONAL DESKTOPS
ECHO.
ECHO A. Judy
ECHO B. Roger
ECHO C. RETURN TO DOS
ECHO.
CHOICE /C:ABC Choose an Option
IF ERRORLEVEL 3 GOTO END
IF ERRORLEVEL 2 GOTO Roger
IF ERRORLEVEL 1 GOTO Judy

:Roger
SET NAME=Roger
GOTO RUN

:Judy
SET NAME=Judy
GOTO RUN

:RUN
ECHO Loading Windows for %NAME%
COPY %NAME%\*.GRP > NUL
COPY %NAME%\*.INI > NUL
COPY %NAME%\WINEW.COM > NUL
WINEW %1 %2 %3
ECHO Saving Windows for %NAME%
COPY *.GRP %NAME% > NUL
COPY *.INI %NAME% > NUL
IF EXIST WIN.COM COPY WIN.COM %NAME%\WINEW.COM > NUL
DEL *.GRP > NUL
DEL *.INI > NUL
IF EXIST WIN.COM DEL WIN.COM > NUL
:END
```

*End*

## DOS WORLD

# Q&A

Edited by Doug Lowe

## HARDWARE

**Q** My computer, a 66MHz 486DX2 with 8MB of RAM and a 210MB hard disk, runs Windows like a dog. A friend of mine has a 33MHz 486SX, yet programs seem to load twice as fast on his system. I added a SMARTDRV command to my AUTOEXEC.BAT file and switched to a permanent swap file, but that helped only a little. Why do you think my PC system is so slow?

**A** It's hard to say without taking a close look at the system. The first thing to check is the Turbo switch. That sounds obvious, but I once cursed my computer for two days before I realized that the machine was running at half speed because the Turbo switch was depressed.

If the Turbo switch setting isn't the problem, consider the video card next. For best Windows performance, you need a 486 motherboard with a local-bus video card. Local-bus video can make a huge difference in Windows' speed, enough that a 33MHz 486SX with a local-bus video card may run Windows faster than a 66MHz 486DX2 without local-bus video.

Why the huge difference? Two reasons. First, a local bus is a 32-bit bus, whereas a standard (ISA) bus is only a 16-bit bus. So a local-bus video card moves twice as much information with each operation as an ISA video card. Second, a local bus runs at the same clock speed as the system's motherboard. The motherboard for a 66MHz 486DX2 runs at 33MHz. In contrast, a standard ISA bus runs at a paltry 8MHz—no matter how fast the motherboard is.

Fortunately, a local-bus video card doesn't cost an arm and a leg; a decent one goes for about $125. Of course, to utilize it, your computer's motherboard must have local-bus capability. Nearly all new computers do, but an older 486 motherboard may not. When in doubt, have a competent technician check it out.

If you already have local-bus video, something else may be amiss. I'd have a technician look the computer over. For $30 to $50, you should be able to find out whether something is wrong, or whether it's time to upgrade to a Pentium.

**Q** My notebook computer has built-in power management. When I activate those features, it shuts down the video, the hard disk, and the CPU after a certain period of inactivity. Whenever I use power management while working in Windows, however, Windows stops keeping track of the time. That becomes a real problem when I go into Quicken to print checks; if I forget to reset the time, the wrong date sometimes appears on checks. Can you help?

**A** I can think of two possible causes of your problem. Most likely, you haven't told Windows that your computer supports power management. To do so, follow these steps:

- Quit Windows by selecting File/Exit (Alt+F4) from Program Manager.
- Switch to your \WINDOWS directory, then run its setup program by typing `SETUP`.
- In the opening System Information screen, highlight the top option: Computer.
- In the subsequent screen, select one of the two options that supports advanced power management (APM). If your computer uses an Intel 386SL (a special version of the 386 processor that supports power management), choose the option Intel 386SL Based System with APM as the system type. Otherwise, choose the option MS-DOS System with APM.
- Quit Setup and restart Windows by typing `WIN`.
- Call up Control Panel by double-clicking on its icon in Program Manager's Main group.
- Double-click on the Power Management icon.
- You have three options: Off, Standard, and Advanced. To take full advantage of your system's power management, select the Advanced option and quit Setup. If your system behaves strangely after activating this feature, run Setup again and choose Standard. Your computer will retain its power-management capability, but Windows will no longer be involved in handling these system tasks.

If you still have clock problems after telling Windows that your system offers power management, your computer's power management probably doesn't conform to the APM standard. In addition to precipitating clock problems, non-APM power management can cause more serious difficulties, such as file corruption. If your computer doesn't fully support APM, run Windows Setup and select MS-DOS System as the computer type. Your clock will keep good time, and you'll reduce the chances that the files on your hard disk will become corrupted.

**Q** I'm considering buying an Intel OverDrive DX2-66 (or equivalent) for my 25MHz Packard Bell 483SX. Because my motherboard has an extra socket that will accommodate an OverDrive chip, I can install the chip without removing the original one. What I'd like to do instead, however, is replace the original 486SX chip with an OverDrive central processing unit (CPU), leaving the second socket free. What would happen if I put a second OverDrive chip there? Would I then have a 132MHz system? Or would my computer simply become a paperweight?

**A** Don't even consider trying this. Upgrading a CPU, either by replacing an existing CPU with an OverDrive chip or by adding an OverDrive CPU to an empty socket, could trigger compatibility problems.

As long as you play by the book, however, it's safe to add an OverDrive chip to your Packard Bell to improve its performance. But you must know exactly which Packard Bell model you have (each model has a different motherboard), and you must contact Intel or your local computer reseller to find out which OverDrive model to purchase.

After installing an OverDrive chip, you usually also have to set jumper switches on the motherboard to indicate the change.

Installing an OverDrive chip in an empty socket disables the existing CPU, so you don't benefit from having two CPUs in your computer. Even if both CPUs could operate, you'd need an advanced operating system, such as Windows NT, because MS-DOS and Windows wouldn't know what to do with two processors.

**Q** I have a 286 with a 30MB hard drive and 1MB of RAM. As you can imagine, my hard disk fills up frequently, so I used DOS 6.2's DriveSpace to increase my disk's capacity. Unfortunately, DriveSpace robbed me of 43K of conventional memory, and now my kids can't run Math Rabbit. Can you help? I'll get no peace until my kids get their program back.

**A** I guess there's no such thing as a free lunch; in this case, the price of your meal is the 43K required for the DriveSpace device driver. On a 386 or later system, you can tuck this 43K device driver into upper memory, but with a 286, you're stuck. A 286 doesn't have the memory-management skills necessary to use upper memory.

The easiest solution is configuring your system so that your kids can access Math Rabbit without activating DriveSpace. To do that, move Math Rabbit to the uncompressed area of your disk, which DriveSpace usually designates as drive H.

Then tell your kids to watch the screen carefully when they start the computer. They should press Ctrl+F5 the moment they see the message "Starting MS-DOS" on screen. That lets them start the computer without DriveSpace.

Because DriveSpace isn't working, none of the data on your compressed drive is available. The uncompressed drive is available, though—as drive C, not as drive H. After your kids get their fill of Math Rabbit, simply reboot when you need to use the computer. DriveSpace will activate and your compressed files will be available once again. ■

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*Contributing Editor Doug Lowe is the author of 15 computer books, including* The Only DOS Book You'll Ever Need *(Murach),* The Least You Need to Know About DOS *(Murach), and* The Microsoft Press Guide to DoubleSpace *(Microsoft Press).*

Windows TIP

## ICON SEE CLEARLY NOW

The default icon that Windows applies to all DOS applications—a stylized monitor displaying the message *MS DOS*—isn't very attractive. The good news is you can change the icon assigned to a DOS application and substitute one that not only is better looking but also provides a visual clue about what its associated application does.

First, working within Program Manager, click on the icon you want to change. Then select Properties from the File menu. From the Program Item Properties dialog box, click on the Change Icon button. If you receive a message telling you that no icons are available for the specified file, click on OK. The next window you see lets you scroll through all the icons in Windows' PROGMAN.EXE file. You can select one of these icons by clicking on it and pressing Enter.

If you don't see an icon you like, choose the Browse button and type `MORICONS.DLL` in the File Name box; this file contains some nifty-looking choices. When you find an appropriate icon—for example, the stylized typewriter icon from PROGMAN.EXE to identify your DOS-based word processor—keep clicking on the OK button until you return to Program Manager, which should now display the selected icon for the specified DOS application.

**—Jack Nimersheim**

# How to Use

**REPLACEABLE TEXT**

**Articles in *DOS World* will often give you a command that includes text you must replace with your own information. This replaceable text is in italics. For example, in the following command, you'd replace *filename* with the name of your own file:**

**COPY A:*filename* B:*filename***

## THE CONFIG.SYS FILE

In your root directory is a file called CONFIG.SYS. Like AUTOEXEC.BAT, this file is in ASCII, and you can view your CONFIG.SYS file with the TYPE command. A typical CONFIG.SYS might look like this:

```
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE NOEMS
DOS=HIGH,UMB
FILES=50
BUFFERS=10
SHELL=C:\DOS\COMMAND.COM
  C:\DOS\ /E:1024 /P
DEVICE=C:\DOS\ANSI.SYS
DEVICE=C:\DOS\SETVER.EXE
```

The rules for handling CONFIG.SYS are the same as they are for AUTOEXEC.BAT: Always back up the original file before you modify it and always have an emergency boot disk available. As with AUTOEXEC.BAT, changes you make to CONFIG.SYS won't take effect until you restart your computer.

**ANSI.SYS AND THE ESCAPE CHARACTER**

When an article says you must have ANSI.SYS installed, it means that the MS-DOS file ANSI.SYS should be in your \DOS directory, and the following line should be in your CONFIG.SYS file:

```
DEVICE=C:\DOS\ANSI.SYS
```

Some articles that discuss ANSI.SYS will also ask you to create a batch file that uses the escape character. Unfortunately, there's no uniform method of doing so. If you use EDIT, the text editor that comes with MS-DOS, you can make an escape character by pressing Ctrl+P and then the Esc key. The escape character appears on screen as a small left-pointing arrow. If you're using another text editor or word processor, check its instructions for information on how to enter the escape character.

## THE AUTOEXEC. BAT FILE

Most people have a batch file called AUTOEXEC.BAT on their hard disks. If you want to look at it, first go to your root directory by typing CD\. Type DIR to make sure AUTOEXEC.BAT is there. Then type the following command:

```
TYPE AUTOEXEC.BAT | MORE
```

A simple AUTOEXEC.BAT file might look like this:

```
@ECHO OFF
PROMPT $P$G
PATH=C:\DOS;C:\WINDOWS;C:\WP51;C:\BAT
C:\DOS\SMARTDRV.EXE
C:\MOUSE\MOUSE.COM
C:\DOS\DOSKEY.COM
SET TEMP=C:\TEMP
```

When a *DOS World* article instructs you to modify your AUTOEXEC.BAT file, always make a backup copy of the original AUTOEXEC.BAT first. The most common names for your backup copy are AUTOEXEC.BAK or AUTOEXEC.BK. The latter lets you save different versions of your backups—for example, AUTOEXEC.BK1 and AUTOEXEC.BK2. You create a backup copy with the following command:

```
COPY AUTOEXEC.BAT AUTOEXEC.BAK
```

Also, you should have an emergency boot disk available whenever you modify AUTOEXEC.BAT. (See the accompanying section on the facing page, top.) It will let you access your hard drive in case you make an error that locks up your computer. Changes you make to AUTOEXEC.BAT won't take effect until you restart your computer.

## BATCH FILES

A batch file is a text file that tells MS-DOS to do a series of tasks. The filename of a batch file always ends with the extension .BAT.

A batch file must be in plain-text format. For example, a batch file might consist of the following lines:

```
CD\
DIR /S /P
```

This batch file moves you to the root directory (CD\) and then gives you a list of all files in all directories (/S), pausing after each full screen (/P).

Every batch file needs a name. In such cases, you should pick your own name. Batch-file names carry the same limitations as any other DOS filename; you're limited to eight characters, plus a three-character extension. A batch-file name must always use the .BAT extension.

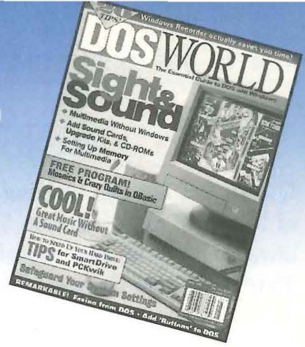
To avoid confusion and unexpected results, don't give any batch file the same name as another program or DOS command. For example, VCOPY.BAT is an acceptable name for a batch file, but not COPY.BAT or XCOPY.BAT, because COPY and XCOPY are the names of DOS commands. To run or execute a batch file, type its name at the DOS prompt. For example, to run a batch file called VCOPY.BAT, type VCOPY at the DOS prompt.

### Creating and Saving

***Using EDIT.*** If you have DOS 5 or later, you can create a batch file using EDIT. EDIT usually resides in your DOS directory. Type EDIT and enter your batch file. When you're done, press Alt+F and choose the Save option. Type the name of your batch file (make sure you add the extension .BAT) and press the Enter key.

***Using other word processors.*** Most word processors don't save files in plain text; they include other characters, such as control characters that handle such matters as page formatting and typefaces. Most word processors, however, do give you an option to save in plain text. The procedure varies from one word processor to the next. For example, when you save a file in WordPerfect 5.1, you choose ASCII Text (DOS) as your Format option.

# This Magazine



## MAKING AN EMERGENCY BOOT DISK

**Sometimes a *DOS World* article will suggest that you create a *bootable floppy*—a floppy disk that serves as an emergency system disk. That is, if your computer for some reason can't access your hard drive, you can start your computer from the emergency floppy. You should always have an emergency system disk available, but it's particularly important when you modify AUTOEXEC.BAT or CONFIG.SYS because you may change those files in such a way that your computer won't start from the hard drive. To create a system disk:**

1. **Insert a floppy disk in drive A.**
2. **At the command line, type FORMAT A: /S (all existing information on the floppy will be lost).**

**DOS first formats the floppy disk. Then it copies three DOS system files to the floppy disk: IO.SYS, MSDOS.SYS, and COMMAND.COM.**

**The first two are hidden files; you won't see them if you type DIR A:. If you have the disk-compression program DoubleSpace on your computer, the FORMAT command above will also copy DBLSPACE.BIN, a third hidden file, to the floppy disk.**

**After you've created your system disk, you should copy a few other basic files to your floppy. Go to your \DOS directory and copy the following files: FORMAT.COM, EDIT.COM, EDIT.HLP, QBASIC.EXE, UNDELETE.EXE, CHKDSK.EXE, FDISK.EXE, and SETUP.EXE.**

## DEBUG SCRIPTS

A Debug script is a list of assembly-language instructions you convert to an executable program using the program DEBUG.EXE in your \DOS directory.

***Creating the script.*** A Debug script must be in plain text. The procedure for creating the script is the same as for creating a batch file. You can use DOS's EDIT program, or you can use a different text editor or word processor and save the script in plain text format.

***Creating an executable program.*** After creating and saving the script, type the following command at the DOS prompt:

```
DEBUG < filename
```

where *filename* is the name of the Debug script you created. For example, if the name of your Debug script is KEYPRESS.SCR, you'd type this line:

```
DEBUG < KEYPRESS.SCR
```

at the DOS prompt. The executable program created by Debug will have the extension .COM. The name of the executable file is determined by the contents of the script. Our convention is to use the same name for the executable file as we do for the script. Thus, the executable file created by KEYPRESS.SCR will be named KEYPRESS.COM. Once you've created the executable file, you run it by typing its name at the DOS prompt. To run KEYPRESS.COM, type `KEYPRESS`.

## PATHS AND THE PATH STATEMENT

*DOS World* articles often tell you to make sure that a particular file is in a directory included in your PATH statement. This lets you runs a .COM, .EXE, or .BAT file from any directory on any drive.

For example, an author might tell you to create a batch file called TEST.BAT, put it into a subdirectory called \BAT, and put the subdirectory into your PATH statement. You can then execute TEST.BAT by typing `TEST` from anywhere on your drives, without having to change to the \BAT directory first.

The PATH statement is a line in your AUTOEXEC.BAT file. It gives DOS a list of directories to search for requested files. Here's an example:

```
PATH=C:\DOS;C:\WINDOWS;C:\BAT
```

When you type `TEST` at the DOS prompt, DOS looks for the program first in the current directory, then in the root directory, and then, in order, the \DOS, \WINDOWS, and \BAT directories. When it finds TEST.BAT in the \BAT directory, it executes the batch file.

*Continued on page 64*

## BASIC DEFINITIONS

**DOS prompt.** Also known as the *command prompt*. By default, the DOS prompt looks like this: C:\>. This is where you type the instructions to run programs or DOS commands.

**Boot, boot up, reboot.** The process of starting or restarting your computer. Turning on your computer is *booting* or *booting up*. Pressing the key combination Ctrl+Alt+Del restarts, or *reboots* your computer. So does pressing the reset button, if your computer has one.

**Extensions.** When we refer to a program by its common name (for example, the DOS command FORMAT) without an extension, you can assume that the extension is .COM or .EXE. When we refer to a batch file, we always include the extension .BAT. QBasic program names must always include the .BAS extension.

**ASCII.** American Standard Code for Information Interchange. For our purposes, an ASCII file is a plain text file, one that consists entirely of the characters you see on your keyboard.

**Directories.** Your hard drive has a main directory called the *root* or *home* directory. Directories created off the root directory are called *subdirectories*. When we provide the name of a subdirectory, it will look something like this: \WORD\FILES. Here, the root directory has a subdirectory called WORD, which in turn has a subdirectory called FILES.

**File placement.** We assume that the following files are in your root directory: AUTOEXEC.BAT, CONFIG.SYS, and COMMAND.COM. We also assume that your DOS files are in a DOS subdirectory, usually called \DOS.

**Keystroke combinations.** When you should hold down one key while pressing a second, we indicate it this way: Alt+F4 (press the Alt key and hold it down while you press the F4 key). When you should press one key, release it, and press another, we indicate it this way: Alt, F4 (press the Alt key, release it, then press the F4 key).

## QBASIC PROGRAMS

QBasic is the programming language included in all versions of MS-DOS since version 5. The name of a QBasic program always ends with the extension .BAS.

**Typing in the listing.** Type `QBASIC` at the DOS prompt and press Enter to start. Now type in the listing as printed, pressing Enter at the end of each line. Note that when a line in the listing is indented two spaces from the line above and doesn't start with a command or keyword, it's a continuation of the previous line. Other indentations, or none at all, indicate a new line.

**Subroutines and functions.** QBasic listings often include subroutines and functions, and typing them is confusing at first. They begin with a line containing the keyword SUB or FUNCTION. Note that when you type a SUB or FUNCTION line and press Enter, all other lines you've typed will disappear from view. This can be disconcerting for beginning programmers. There's nothing to worry about—your listing is safe. To avoid screen clutter, QBasic simply hides other parts of your listing when you're typing in a subroutine or function. To see the other parts of your program, open the View menu at the top of the QBasic screen, then select SUBS. The SUBS dialog box will appear, letting you select the part of the program listing you want to view.

**Saving a listing.** Save your partially completed listing as you go along, rather than waiting until you've typed in the whole thing. To save, open the File menu, choose Save, and type in a filename when QBasic prompts you. We suggest using the filename specified in the magazine article. Subsequent saves of your listing won't prompt you for a filename, but will instead use the filename indicated the last time you saved the listing.

**Running a program.** After you've typed in the entire listing and saved it a final time, you can run the program by selecting Start from the Run menu or pressing Shift+F5. If QBasic finds an error, it will stop the program and highlight that line. To run a QBasic program (a .BAS file) stored on your hard drive, start QBasic, then select Open from the File menu. Choose from among the .BAS files displayed in the open dialog box to load the program into QBasic, then select Start from the Run menu or press Shift+F5. To stop a QBasic program, press Ctrl+Break; select Exit from the File menu to return to DOS.

**DOS World BBS.** Typing and debugging a long listing is time-consuming. If you have a modem, our listings are always available on *DOS World*'s bulletin-board system (BBS) at 603-924-3181. There are no connect-time charges; you pay only for the phone call. Set your communication program to 8 data bits, no parity, 1 stop bit (8, N, 1). Dial the number and wait for the "Connect" message. If you're a first-time user, the system will ask you to enter your name and choose a password. Then it will display a general information screen, followed by a questionnaire requesting your address, phone number, and so on, so that we may set up your account. From this point, on-screen prompts are the same for all users. A series of messages present the latest BBS news; press Enter after each message to go to the next screen. From the Bulletin Menu, Bulletin #1 offers information on navigating the Main and File Menus, with instructions for listing, marking, searching for, and downloading files. ■

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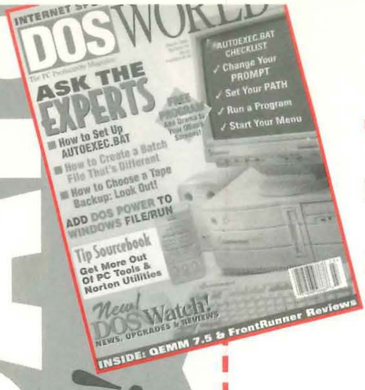

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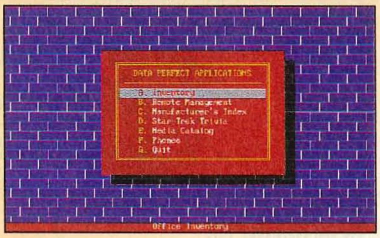

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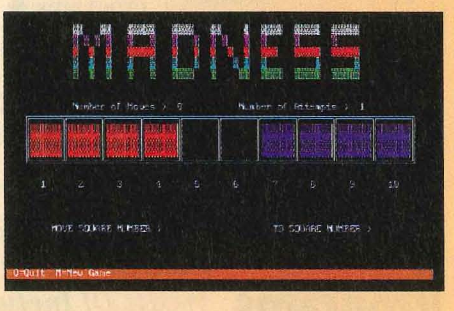

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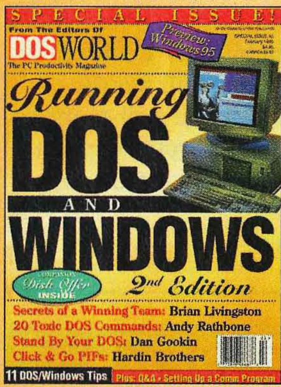
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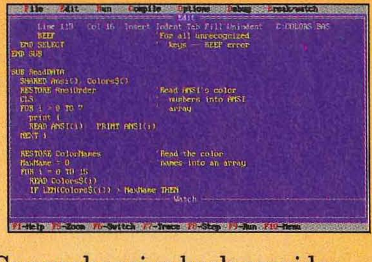
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```
    Line 119   Col 16  Insert Indent Tab Fill Unindent   C:COLORS.BAS
    BEEP                        'For all unrecognized
  END SELECT                    '  keys -- BEEP error
END SUB

SUB ReadDATA
  SHARED Ansi(), Colors$()
  RESTORE AnsiOrder             'Read ANSI's color
  CLS                           '  numbers into ANSI
  FOR i = 0 TO 7                '  array
    print i
    READ ANSI(i) : PRINT ANSI(i)
  NEXT i

  RESTORE ColorNames            'Read the color
  MaxName = 0                   'names into an array
  FOR i = 0 TO 15
    READ Colors$(i)
    IF LEN(Colors$(i)) > MaxName THEN
```

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## UPGRADE UPDATE

- Tremors hitting 6.1 on the upgrade scale have come from Orem, Utah, where Novell has announced **WordPerfect 6.1 for DOS.**

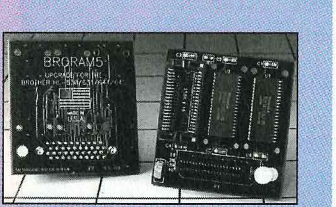
Product Manager Dave Wright says that many popular WP for Windows features will be incorporated into the newest DOS version, including Drop-Caps, Make-It-Fit, Quick-Correct, QuickFormat, and QuickMenus.

Novell plans to start shipping WordPerfect 6.1 in September. Though a suggested price wasn't available at press time, registered owners of version 6.0 can receive a free upgrade. To run WP 6.1, you'll need a 386 PC or later with DOS 3.1 or later, at least 480K of free conventional memory, and 7MB of available hard-drive space.

For more information, contact Novell, 1555 North Technology Way, Orem, UT 84057; 800-451-5151.

*—Mike Angelo*

- If you have a Brother 600-series laser printer, you can expand its memory from 512K to 1.5MB by installing a **BRO-RAM5 1.5** memory upgrade, from Delkin Devices Inc. Prices start at about $100. Contact Delkin Devices Inc., 3245 Greyling Drive, San Diego, CA 92123-2229; 619-571-1234.

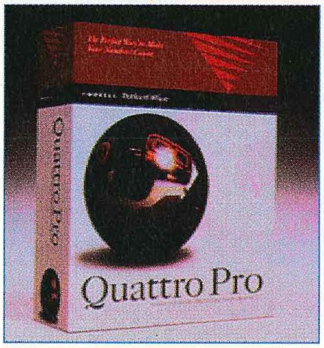


*Continued from page 80*

## DOS Teams with GUI for New Quattro Pro

**As this issue of *DOS World*** was going to press, Novell Inc. had introduced a new DOS upgrade of **Quattro Pro**, the spreadsheet made famous by Borland. (Novell purchased Quattro Pro from Borland in 1994.)

**Version 5.5** combines the power and simplicity of DOS with a graphical user interface (GUI) desktop for what Senior Product Manager Joe Hage says are improved Novell NetWare support, speed formats and fills, quick templates, advanced cell formatting, Lotus 1-2-3 compatible menus and macros, and new printer drivers. Compared with its DOS competitors, Hage says, the new Quattro Pro offers "more font types, more analytical graphs, more slide-show capabilities."



**Version 5.5: DOS meets GUI, for a bigger and better feature set.**

For bare-bones operation, version 5.5 will run on any 8088 or later PC with 512K of RAM minimum and DOS 2.0 or later (version 3.3 or later required for networks).

You'll need a graphics card to take advantage of 5.5's GUI interface, and 2MB of additional extended memory if you want to access Paradox (Novell's database manager). Suggested price is $59.95.

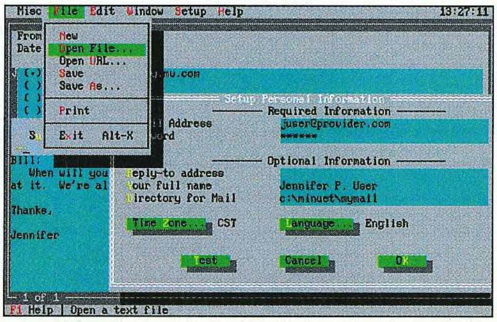
A complete review of Quattro Pro 5.5 will appear in an upcoming issue of *DOS World*. In the meantime, for more information contact Novell Inc., 1555 North Technology Way, Orem, UT 84057; 800-451-5151.

*—Mike Angelo*

## Beta Late Than Never

**From the people** who helped introduce the Internet's Gopher, Veronica, and Archie comes not a Windows-based World Wide Web browser but a powerful DOS-based SLIP (Serial Line Internet Protocol) and browser program called **Minuet**.

While Minuet itself isn't new (see "An Internet Primer," *DOS World* #20, March 1995, page 41), until recently it was simply a shareware program. Refinements to Minuet's graphics/text-retrieval features have been painstaking, to say the least: At press time, it was in its 17th beta version. But developers at the University of Minnesota say only full documentation separates Minuet from becoming "official." Just about any DOS-based PC with 640K of RAM, a hard drive, and a modem can partner with Minuet to dance along the information highway.



Required Information
Address juser@provider.com
******

Optional Information
Reply-to address
Your full name Jennifer P. User
Directory for Mail c:\minuet\mymail
Time Zone... CST
Language... English

Bill:
When will you ... at it. We're al...
Thanks,
Jennifer

Philip Kachelmyer, manager of user services at the University of Minnesota's Distributed Computing Services, says that despite software developers' penchant for Windows, a DOS Internet browser makes perfect sense, "mainly because there was a glaring need for it. At the time we started the project, Windows 3.0 hadn't even been released. And there are lots of users with older machines who need such a product. Even if you've got Windows, Minuet fills a big need."

One such plus is Minuet's caching feature. When you download text or graphical data, Minuet stores it in a "cache" subdirectory on your hard drive. Once off the Internet, you can still call up Minuet and see what you've downloaded. You can also delete files in the cache at any time.

Download Minuet (MINUARC.EXE) via FTP (File Transfer Protocol): **minuet.micro.umn.edu/pub/minuet/latest**. It's also available on CompuServe in the Internet Resource forum (**GO INETRESOURCE**); download MINUARC.EXE from Library 4 (PC Internet Software). You can also download MINUARC.EXE from the *DOS World* BBS (**603-924-3181**); it's in File Area 5. For more information, contact Distributed Computing Services, Attn.: Minuet Shareware, Shepherd Labs, Room 152, 100 Union Street S.E., University of Minnesota, Minneapolis, MN 55455; 612-625-1300. *—Mike Angelo*

## MEMBERS ONLY, Whoever They Are

**This isn't shaping up** to be Microsoft's favorite year. It's bad enough that delays of its long-awaited Windows 95 operating environment have kept rumor and joke mills churning, and that its lawyers are chewing on a rejection of a proposed antitrust settlement with the U.S. Department of Justice, and that government concerns have stalled the company's planned acquisition of Intuit.

Now comes the **Committee to Fight Microsoft** (CTFM), a political action committee representing computing consumers and registered with the Federal Election Commission. One of its goals is "to encourage nationwide grass-roots legislative action concerning anticompetitive activity by Microsoft." This summer, CTFM also hoped to solicit international support for its movement.

Organized in February, the Committee reports that its membership is somewhere between 250 and 1000. Executive Director Anthony "Andy" Martin, a public-interest attorney and computer user in Florida, says that the core of the Committee formed last fall after several computing consumers, including himself, wrote to an America Online forum to complain about the pending antitrust settlement and to look beyond it to address "the problems with Microsoft" for the future.

Specifically, CTFM is seeking Congressional sponsors for a federal bill that would force the breakup of Microsoft. It claims that the software giant has failed to act responsibly in ensuring "interoperability" of computer software and hardware and charges that Microsoft has engaged in cross-subsidization by using markets it monopolizes to finance markets where healthy competition exists.

Martin claims that CTFM has received considerable nationwide feedback on line for its proposed legislation. "We must have blown a few fuses on the Internet," he says. "Mr. Gates may think—or may hope—that we are going to go away. But I suspect our strength is growing."

Microsoft, which didn't return calls from *DOS World*, has previously denied that it has engaged in monopolistic practices, and has expressed a desire to reach an equitable settlement of the antitrust suit.

So who might the members of CTFM be? Whiners? Sour-grapes competitors? The answer may come soon, after the group sets up an office to keep track of membership and other administrative tasks. But Martin says that one reason CTFM organized as a PAC was that it didn't want to become a "shill" for Microsoft's corporate competitors (PAC membership for corporations requires full public disclosure), and neither did it want to be a mouthpiece for any one group of disenchanted users—such as DOS fans who are miffed at Microsoft for abandoning DOS products.

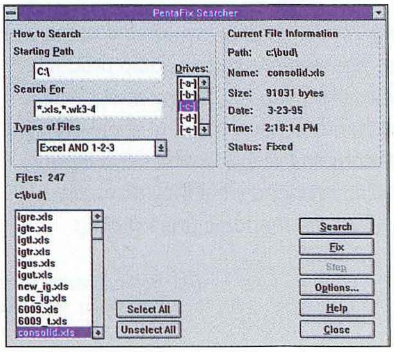
Incidentally, annual membership starts at $49 for individuals and $2500 for corporations. Additional information about CTFM is available via Internet e-mail by writing **FightMS@aol.com**.

*—Kate Chase*

## FLASH!

### Pentium May Be Heading For Light Speed

**Just when you thought your new 486 was lightning** in a bottle, the even-faster Pentium may have come and gone by the time you're ready to upgrade again. *Interactive Age* magazine reports that Intel recently demonstrated its **P6** microprocessor, which is twice as fast as the company's Pentium. In the meantime, Intel continues to deal with the aftershocks of the initial Pentium "flaw." Circle Systems, of Seattle, Washington (800-366-3794), has introduced **PentaFix**, a Windows program that forces Excel and Lotus 1-2-3 to recalculate worksheets that were computed incorrectly on machines with flawed Pentium chips. Users have discovered that simply replacing the chip doesn't guarantee that previously created worksheets will then display correct results.



Starting Path: C:\
Search For: *.xls,*.wk3-4
Types of Files: Excel AND 1-2-3

Path: c:\bud\
Name: consolid.xls
Size: 91031 bytes
Date: 3-23-95
Time: 2:18:14 PM
Status: Fixed

Files: 247
c:\bud\
igre.xls
igte.xls
igtl.xls
igtr.xls
igus.xls
igut.xls
new_ig.xls
sdc_ig.xls
6009.xls
6009_t.xls
consolid.xls

■ **MasterSafe**, the latest version of a data-security system for multiuser PCs, has been introduced by Israel-based EliaShim Microcomputers Inc. MasterSafe is designed to help network administrators protect their DOS, Windows, or OS/2 systems from data theft, corporate espionage, hackers, and violation of private records. Supervisors can assign access rights and even obtain detailed reports of employees' time on the system. Prices begin at $99. EliaShim Microcomputers Inc., 1 S.W. 129th Avenue, Suite 105, Pembroke Pines, FL 33027; 305-450-9611.

■ The **Sirius Service Solution Package** is the latest business suite offered by Sirius Software. Available for DOS or Windows, it includes software for rental management, dispatch and scheduling, inventory control, accounts receivable, accounts payable, and general ledger/bank reconciliation. Designed to automate the service departments of almost any type of business, prices for the package start at $2500. Contact Sirius Software Inc., 345 West Second Street, Suite 201, Dayton, OH 45402-1443; 800-788-4849.

■ Novell-based network administrators can now install, update, and deinstall a customized security setup on any other network workstation—right from their own PCs—with **Network Security Plus 7.0**, from PC Guardian. This Windows product (DOS 5 or later is also required) offers access control, virus protection, automatic version control, and program approval. Prices start at $995 per server. Contact PC Guardian, 1133 East Francisco Boulevard, San Rafael, CA 94901; 800-288-8126.

## ELSEWHERE In Pentium Land

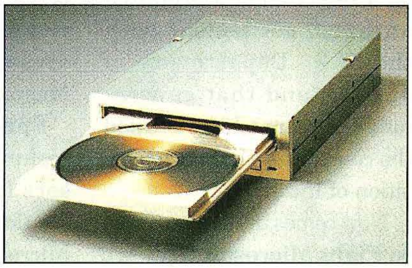
- Channel Marketing Corporation of Dallas, Texas, estimates that nearly 60 percent of all PCs currently sold are **Pentiums**, with the number expected to grow to nearly 80 percent by year's end.

- 75MHz, 90MHz, 100MHz . . . now 120MHz: The speediest of the fast Pentium systems are quickly jumping into the marketplace. Among the first are Gateway's **P5-120** at $3999 (800-846-2063) and Tri-Star Computer's 120MHz **Tri-CAD Personal Workstations**, targeted at architects and engineers, at $3599 to $5799 (602-731-4926, 800-800-7668). Expected to join the bandwagon this summer is the **Diamond P120**, from DFI Inc. (916-568-1234). Designed to handle the hungriest of memory applications with up to 1MB of cache memory and 256MB of RAM in eight on-board SIMM slots, the tower system features a quad-speed CD-ROM drive, a 1GB hard drive, a 16-bit sound card, and a 14.4/14.4kbps send/receive fax modem at prices ranging from $1899 to $3999.

- Serious competition for the Pentium is coming from, among other places, Compaq's new line of **Presario PCs**. They're the first computers to feature quad-speed CD-ROM drives as standard equipment and are billed as the company's "first 586-based consumer models," driven by NexGen's Nx586 chip. NexGen unabashedly labels its chips according to the performance of a comparable Pentium processor. (The Nx586-P100 is supposed to be comparable to the 100MHz Pentium.)

## On the Cutting Edge

- It would appear that fast is never fast enough in the world of CD-ROM technology. On the heels of 3x and 4x drives comes TEAC America's **CD-56E 6x IDE** drive with lightning-quick 110-millisecond seek time and 900K-per-second data-transfer rate. In theory, the faster the drive, the smoother the ride: fewer herky-jerky animations and better graphics images. Keep in mind, however, that most video used in multimedia CD-ROMs is still recorded at only 150K per second. Alas, the software hasn't caught up with the hardware. But when it does, TEAC claims that the CD-56E 6x's file retrieval and transfer will be three times that of a dual-speed drive.



List price is $549. Contact TEAC America Inc., Data Storage Division, 7733 Telegraph Road, Montebello, CA 90640; 213-726-0303.

- Work on your office PC at home or abroad with **Phone Director**, a new telephone-activated power controller from Newpoint Corporation. No matter where you are in the world, if you can get to a touch-tone phone, you can "call" your PC, power it up, then send a fax or use your modem, check your e-mail, and even transfer data. If you need to reboot, you can; one touch-tone key will shut everything down again. Phone Director includes complete surge protection, a lifetime warranty, and a $10,000 guarantee from the manufacturer to repair or replace any Phone Director-activated system damaged by power disturbances. Suggested price is $119.95.

For more information on Phone Director, contact Newpoint at 6370 Nancy Ridge Drive, San Diego, CA 92121-3212; 619-453-7569.

- U.S. Robotics' new **Sportster Vi 28.8 Faxmodem** opens the door to desktop conferencing and interactive gaming. Its Digital Simultaneous Voice and Data (DSVD) standard lets users talk and share applications simultaneously over a single phone line. The possibilities are endless: Have a chat while sharing graphics, photos, or even video.

The first Sportsters will be internal only, with a list price of $389. Contact U.S. Robotics Inc., 7770 North Frontage Road, Skokie, IL 60077; 800-DIAL-USR (800-342-5877).

## THAT'S WHAT THEY SAID

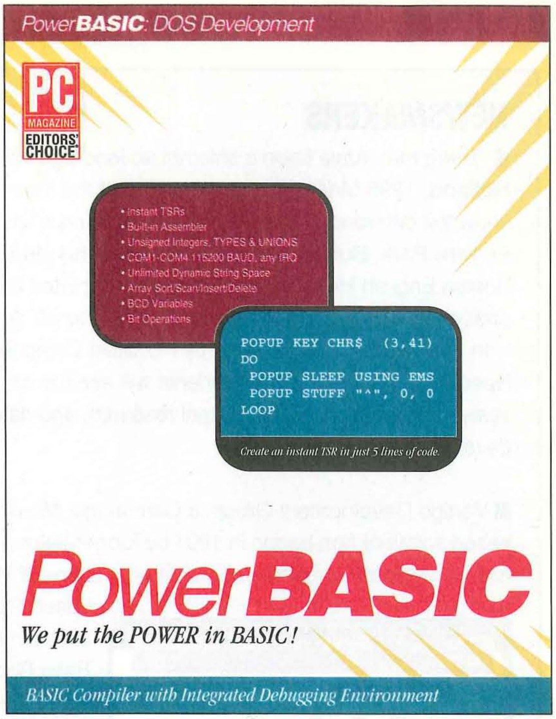
- In 1994, CD-ROM sales hit $1 billion, while floppy-disk revenues were $3.5 billion. "We believe that sales of CD-ROM are going to surpass floppy sales sometime in 1996."

—*Scott Garner, market analyst;*
The Boston Globe, *May 10, 1995*

- Do PC-based audio vendors perceive a need to provide the same verifiable performance data that accompanies consumer audio products? "If you look at the consumer audio market, you are talking about people spending $99 or more. But [fewer] than one percent of the speakers sold for desktop PCs reach even the bottom end of that consumer market. Until [computer] consumers are willing to spend what they do in the consumer audio market, you won't see the manufacturers putting together that kind of data."

—*Rich Sorkin, Creative Labs;*
PC World, *May 1995*

*"... DOS (BASIC) developers would do better to look beyond Microsoft.™"*
PC Magazine, *September, 1993.*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• Bit Operations
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# Move Up to . . .

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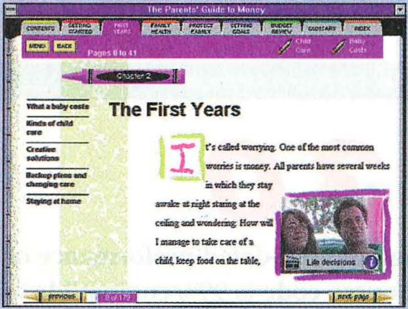
## NEWSMAKERS

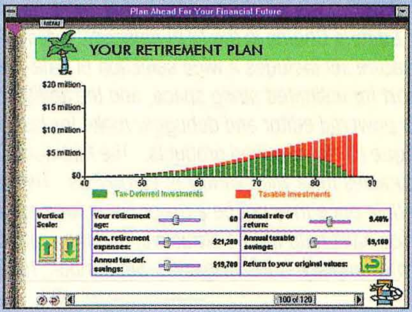
■ There may have been a time not so long ago that **Jerry Holland**, 1995 Massachusetts Teacher of the Year, didn't know the difference between a hard drive and a line drive at Fenway Park. But no more. With the aid of his students at Boston English High, Holland recently completed a class project: building a 486 PC from scratch. The kit, complete with instructions, was donated by PC-Build Computers of Needham, Massachusetts; students will use the completed system for word processing, legal research, and database development.



The First Years

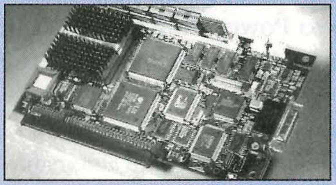
It's called worrying. One of the most common worries is money. All parents have several weeks in which they stay awake at night staring at the ceiling and wondering: How will I manage to take care of a child, keep food on the table,

■ Vertigo Development Group, a Cambridge, Massachusetts-based software firm begun in 1991 by former Lotus employees, has successfully created and marketed a series of Windows-based CD-ROM titles aimed at busy Baby Boomers facing the realities of financial, family, and personal stress. In the process, reports *The Boston Globe*, Vertigo has quickly relieved its own financial stress by earning back some $5 million in venture capital used to start the company. Vertigo's 17 titles in its **ActiveBook** software line combine entertainment with information to help users get the answers to life's tough questions without having to pore over dozens of newspaper or magazine articles. Titles include Parents' Guide to Money, Personal Finance Planning, and Plan Ahead for Your Financial Future. Vertigo's Mutual Fund Selector is a cooperative venture with Intuit, publisher of the popular do-it-yourself finance program Quicken; an interactive game helps Boomers figure their comfort level before trying risky investments. For more information, call Vertigo Development at 617-225-2065.



Your retirement age: 60
Annual rate of return: 9.40%
Ann. retirement expenses: $21,200
Annual taxable savings: $5,100
Annual tax-def. savings: $19,700
Return to your original values:

■ DOS remains a strong player in cross-platform technology, at least as far as Apple Computer Inc. is concerned. Recently, the Cupertino, California, giant entered into a licensing agreement with Reply Corporation for its **DOS-on-Mac** adapter cards, which let Macintosh users run DOS and Windows applications on Power 7100/66 systems. The card shares up to 4MB of Mac memory, provides SVGA support, and optionally adds an extra parallel port or serial port. This fall, Reply expects to include drivers for Windows for Workgroups and LAN Manager. Prices start at $695. For more information, contact Reply Corporation, 4435 Fortran Drive, San Jose, CA 95134; 408-942-4804.

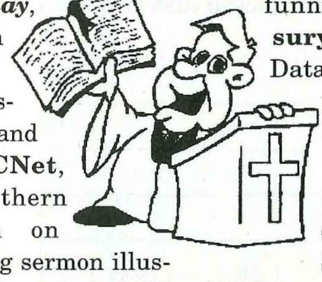


## DO I HEAR AN AMEN?

**Some of the** liveliest and most thought-provoking on-line dialogue these days takes place on religion forums. But religion and high tech are also merging to help teach and equip clergy and others in ministry as well as users who simply want to know more.

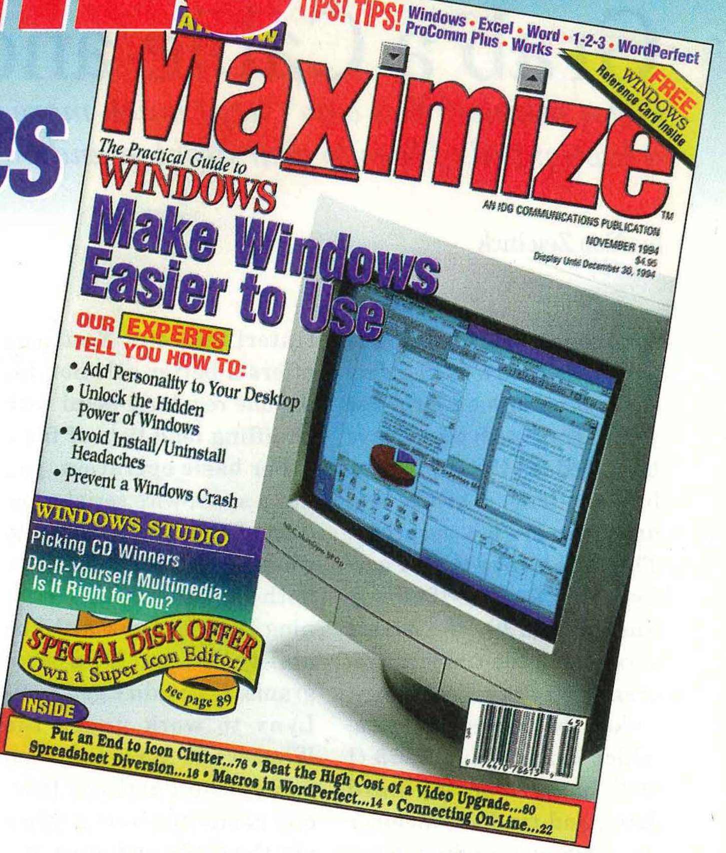
For example, the **Torah La-Am Library**, a Windows program, is a comprehensive and powerful learning tool for those interested in studying the five books of Moses. This interactive multimedia program tells stories, reports opinion, and prompts questions designed to provoke thoughtful discussion among people of all faiths. Prices start at $19.95. Contact Torah Productions, 3070 North 51st Street, Suite 510A, Milwaukee, WI 53210; 414-445-2002.

Among Christian organizations that have increasingly been posting on-line resource forums are the magazine ***Christianity Today***, which offers services on America Online targeting the needs of pastors, music ministers, and youth directors; **SBCNet**, which serves the Southern Baptist Convention on CompuServe, providing sermon illustrations, Sunday-school curricula, and ministry ideas to 4000 members of various denominations; and **The Worship Center**, the newest Christian on-line forum, organized by *Worship Leader* magazine and dedicated to providing church musicians worldwide with product information, ministry ideas, job opportunities, and even a forum on the use of MIDI in worship services.



On the lighter side is a Windows collection of religious-life bloopers and funnies, **Rev. Lowell's Treasury of Humor**, from Bardon Data Systems. It features thousands of real-life stories, quotes, and anecdotes—all indexed and many illustrated—as compiled by veteran minister Rev. Lowell Streiker. Suggested price is $18.95 per volume; $68.95 for all six volumes in the series. For more information, contact Bardon Data Systems, 1023 Key Route Boulevard, Albany, CA 94706; 510-526-8470.

# Maximize
# The Possibilities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# TAKE CHARGE WITH MAXIMIZE

FASTLYNX LITE FOR DOS

# Grab a Cable and File It

*Got a minute? You won't need much more than that to transfer a laptop full of files to your desktop and back again.*

by Alan Zeichick

It's easy to tell when you're dealing with a DOS utility that's been around for a few years: The rough edges have been filed off, the HQ (hyperbole quotient) is pretty low, and there are few surprises. That's the case with FastLynx Lite for DOS (formerly FastLynx 2.0), the latest version of a file-transfer program from Rupp Technology. I liked the previous version, which came out in 1989 (I still have it on my hard disk), and fondly remember the program's original incarnation, FastWire II.

FastLynx copies files quickly from one computer to another. That might sound mundane, considering that several of the newer versions of DOS come with a basic file-transfer utility (InterLink). But FastLynx offers a better solution for anyone regularly faced with shuffling long lists of files.

PC MAGAZINE EDITORS' CHOICE
RUPP
FASTLYNX
FILE TRANSFER SYSTEM
FASTLYNX LITE FOR DOS
SERIAL CABLE INCLUDED
NOVELL NETWORK
Direct Station to Station File Transfer
2 PROGRAMS FOR THE PRICE OF 1
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BREAKTHROUGH FILE COMPRESSION
Increase Transfer Speed up to 200% Depending on CPU and File Type
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For basic operation, you use a seven-wire serial cable (included in the package) to connect the two computers: both PC compatibles running DOS, or OS/2 with the ability to run DOS programs. (I couldn't get FastLynx to work under the Windows 95 M8 beta.) Then you upload FastLynx from one computer to the other via the cable and start the program on both machines. It sounds simple, and it is.

But that's not the best part. FastLynx claims a maximum file-transfer rate of 230,000 bits per second over the serial cable (which has both 9-pin and 25-pin connectors at each end). That translates to a rate of about 1.64MB per minute—pretty good. But over a parallel-port-to-parallel-port cable ($10.95 extra), Rupp claims you can reach 700,000 bits per second, or 5MB per minute.

In my own tests, sending files between a 33MHz 486SL laptop and a 66MHz 486DX desktop PC, I came close to achieving that optimum performance. Sending 243 files totaling 13,758,517 bytes (13.12MB) took eight minutes 12 seconds over the serial cable, but only three minutes 50 seconds over the parallel cable, for rates of 1.60 and 3.42MB per second, respectively. Hey, spend the $10.95 and get the parallel cable.

The main characteristic that sets FastLynx apart from InterLink is that it's an application—not a device driver you have to load from CONFIG.SYS.

That means that when you're not actually transferring files, FastLynx isn't taking up any memory.

You'll discover other advantages, as well. Perhaps you need to synchronize files between your laptop and your desktop PC: moving data to the laptop on Friday and back again on Monday, for example. Only a few files are likely to change over the weekend. No problem: Just set FastLynx's options, and it'll copy only altered or new files to synchronize with specified hard-disk drives or directories.

Or if you need to make your routine copying procedure more specific, you can use FastLynx's Form mode to preprogram the actual files and directories you want to copy.

For example, you can tell FastLynx to always copy all new or altered DOC files from your C:\WINWORD directory, and the WK1# files from the \LOTUS directory—and nothing else.

I use Form mode regularly, before taking my laptop on the road and then when I return to the office.

If FastLynx has a fault, it's in the documentation: It's too short, there's no index, and it's smug. (For example, from page 20: "In addition to the excellent help screens you also have access to the on-line reference guide, available from the main menu. It is an extremely comprehensive guide to both running procedures and technical information.")

Perhaps I should take back my comment about a low HQ, especially because the help is neither excellent nor comprehensive.

Nevertheless, if you often send mass quantities of files between adjacent computers, FastLynx will save you lots of time and effort.

*Alan Zeichick is editorial director of Miller Freeman's* CADENCE *magazine and is a daily user of DOS, Windows, OS/2, and the Macintosh. He lives in San Francisco.*

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*Continued on page 79*

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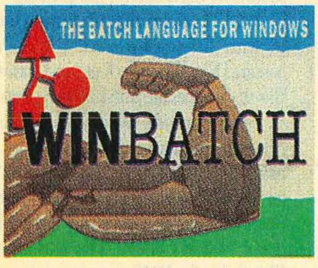
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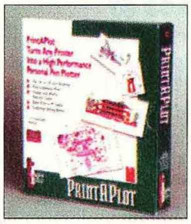

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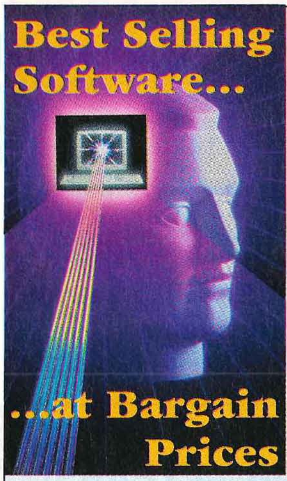

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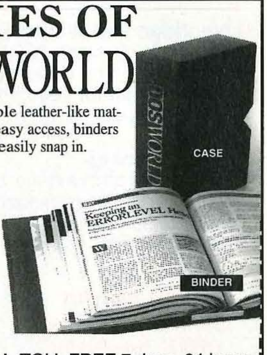

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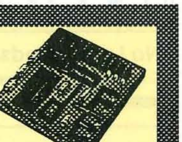

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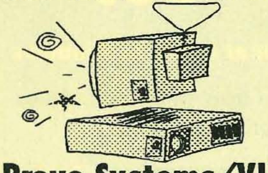

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*Continued from page 74*

## TAKE COMMAND

# Command Performance

*Don't let the point-and-click blues get you down. Take Command lets you run Windows faster and more easily by making it work like good ol' DOS.*

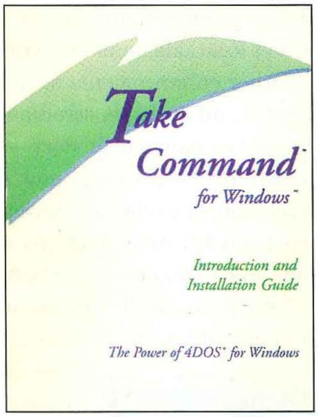
by Stanley J. Wszola

Take Command, a DOS-like command-line utility for Windows, uses text-based, pull-down menus to run DOS and Windows applications. It's ideal for performing tasks such as managing your hard-disk drive, creating the equivalent of DOS batch files, and starting applications under Windows.

Sure, you can use Program Manager and File Manager, but Take Command is simpler (no icons!) and uses fewer resources than it takes to start a DOS session.

Take Command's designers, J.P. Software, also created 4DOS, a substitute for DOS's COMMAND.COM. But don't worry: You don't need 4DOS to take advantage of Take Command. (You do need a 386 PC or later with hard disk and floppy drive, plus DOS 3.1 and Windows 3.1 or later.)

Combining the two programs, however, will give you extraordinary control over both DOS and Windows. Load this little utility and you'll be able to run DOS applications under Windows in several ways, depending on your needs:



- Open a DOS window and run a program from the command line.
- Click on the DOS program name from the applications list, or run the program from the command line.
- Run older DOS programs within the Take Command window.

If you want full command-line control of Windows, you can also use Take Command as your Windows shell, replacing Program Manager. In essence, you can eliminate the use of graphical tools to start Windows applications or manage files.

When you first run Take Command, you'll see a standard window with a menu bar across the top and a status bar on the bottom showing date, time, memory usage, and resource usage. Though combining a GUI and a command line can be confusing at first, the list of commands corresponds to those most often used under DOS. Take Command, however, does offer more specialized commands and options, as well.

An example of the program's versatility is the DIR command. You can set it up in any of several ways:

- to display one, two, four, or five columns
- to display the compression ratio of each file (if you use DRVSPC)
- to display files with color coding for subdirectories and particular file extensions
- to list files with attributes
- to sort files according to various criteria
- to pause after each screen

You can also make these and other options permanent with the ALIAS command, which records a command line and associates it with a simpler one.

For example, you may want to mix several options to display all files in the current directory in two columns, sorted vertically (C:\DIR /2/P/V). Set up this format as the default, using an alias:

```
C:\>ALIAS DIR2=*DIR/2/P/V
```

Thereafter, every time you type `DIR2` at the command line, you'll see the directory the way you want it.

Among its other features, Take Command lets you pop up simple dialogs from batch files, pass keystrokes to Windows applications, and use a Windows-based dialog to find files or text on any of your disks. Take Command also provides a customizable toolbar that gives you quick access to Windows commands and apps and direct access to Program Manager. Windows dialogs let you edit environment variables, aliases, file descriptons, and start-up parameters.

I used to be dissatisfied with Windows altogether. The mouse and the graphical user interface seemed more a distraction than a way to make computing easier. But Take Command is adjusting my anti-Windows attitude. Now when I want a DOS-like command line, I get Windows to work the old-fashioned way: my way—the DOS way.

*Stanley J. Wszola is a freelance writer and systems-support analyst. Contact him on CompuServe at **71011,1726**.*

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DOS WORLD

# DOS Watch

News and reviews of DOS enhancements, upgrades, and products

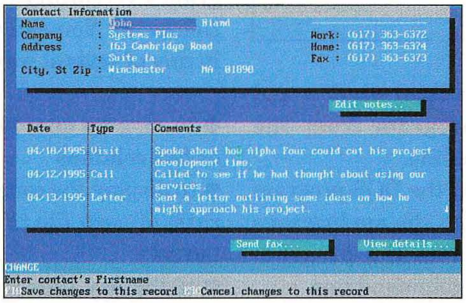
Edited by Steven F. Smith

## Sky's the Limit For DOS Database War-Horse

**Alpha Software's** venerable DOS database manager, Alpha 4, is not only one of the best-selling products of its kind (more than a million copies since 1990), it's also committed to a bright future—in DOS. Say what? By July, the Burlington, Massachusetts-based company will introduce **Alpha 4 6.0** for DOS, incorporating the point-and-click feel of a Windows interface (arrow keys work just as well) while fully maintaining the program's DOS methods and heritage.

Cochairman Richard Rabins acknowledges that his company's "long-term growth is in the graphical world" (the company has, in fact, introduced the all-Windows Alpha 5), but with Borland and Microsoft saying no to DOS databases, "we're saying yes, as long as there is customer interest."

Some might call it fanatical. "Users are saying: We beg of you, don't abandon DOS," Rabins claims. And Alpha has also been listening to user suggestions for improvement, incorporating many of them into version 6.0. "Their wish lists and ideas are endless," Rabins adds. "I guess it proves you can never underestimate the possibilities. People say you can't do interesting things in DOS; that's hogwash."



Contact Information
Name : John Bland
Company : Systems Plus
Address : 163 Cambridge Road
: Suite 1a
City, St Zip : Winchester MA 01890
Work: (617) 363-6372
Home: (617) 363-6374
Fax : (617) 363-6373

| Date | Type | Comments |
|---|---|---|
| 04/10/1995 | Visit | Spoke about how Alpha Four could cut his project development time. |
| 04/12/1995 | Call | Called to see if he had thought about using our services. |
| 04/13/1995 | Letter | Sent a letter outlining some ideas on how he might approach his project. |

CHANGE
Enter contact's Firstname
Save changes to this record Cancel changes to this record

The newest Alpha 4 will feature a tidy and colorful file-folder system, called *tabbed subforms*, which give users the option of point-and-click access to information such as customer orders and credit histories without closing one application before opening another. Templates are built in for basic tasks, such as routine mailings and sales contacts. A CD-ROM option lets users tap into the U.S. Postal Service's quarterly disc of current addresses for no-fail mailings: no more wrong street locations, mail forwarding, or duplicate mailings.

Other enhancements include multiple category links (one to many) and multiple scrolling of, say, a customer's orders and his or her payment history—all without switching screens. In addition, the program now features create-your-own menu bars; one-step editing, moving, and merging of entire blocks of text; and 127 more fields per database, 800 more fields per layout, and 15,000 more characters per memo field.

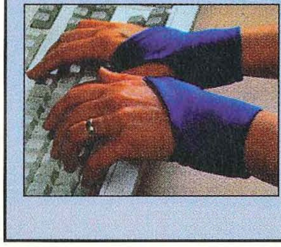
Designed for the single-user or small-business decision maker (although the U.S. Secret Service is a big customer, too), Alpha 4 6.0 requires 4MB of memory and a 386 PC or later. A mouse is optional but definitely a plus. Suggested price is $149.95; an upgrade is $79.95. Contact Alpha Software Inc., 168 Middlesex Turnpike, Burlington, MA 01803; 617-229-2924; fax 617-272-4876.

*—Steven F. Smith*

*Continued on page 68*

## VERY ODD(S) 'N' ENDS

- They look like something a golfer might wear to improve his or her grip, or a roller blader might use to brace for a fall, but no, **MouseMitts** are specifically designed for aching wrists resulting from hours of computer keyboarding. An odd addition to the corporate wardrobe? Perhaps. But MouseMitts have reportedly brought healing, comfort, and wrist support to those who suffer from carpal tunnel syndrome, tendonitis, and chafing and abrasions brought on by frequent typing. MouseMitts come in three sizes and a variety of colors. For Michael Jackson types, prices start at $9.95 for a single glove; or get a pair for $19.95. Contact MouseMitt International, 75 Green Valley Road, Scotts Valley, CA 95066; 408-335-9599, 800-489-6488.



- All you need is a fairly current version of DOS, a VGA monitor, and a sound card to check out **O.J.-oh**, a song/comedy about O.J. Simpson's lawyers, as sung by California attorney/satirist "Loose" Bruce Kerr.

The song has reportedly received substantial airplay on radio and television, but, more significantly, is believed to be the first to be released on PC disk. Shot in the Dark Entertainment of Campbell, California (408-866-0801), produced the computerized music video using, among other things, Autodesk Animator, a 16-bit Sound Blaster sound card, and Digitech Digital Effects. The company designs custom animations, sound files, and slide presentations.

For more information on the O.J. tune, contact Bruce Kerr at Broken Records, 2139 Jardin Drive, Mountain View, CA 94040; 415-949-2327.

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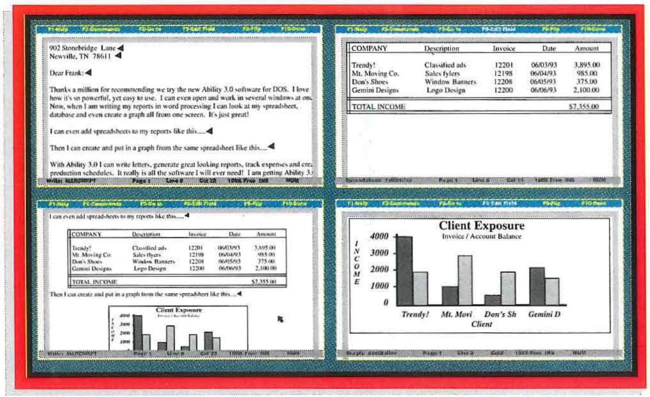

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System requirements: DOS 3.3 or higher; 640Kb/3Mb free HD space
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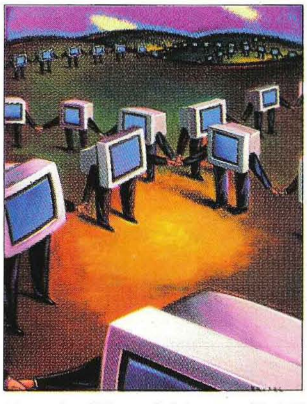
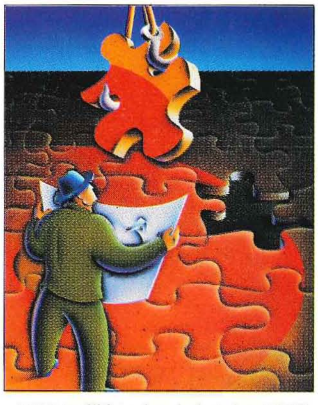
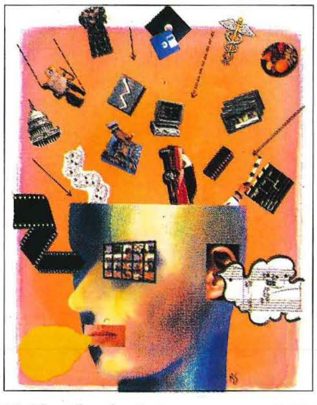
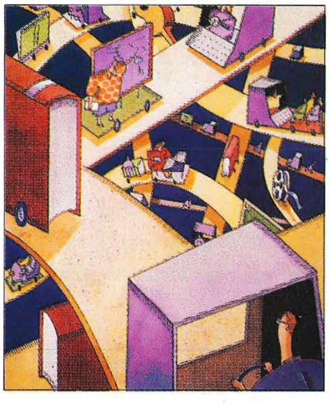

Network utilities—vital, but set aside 100K


DOS 6 utilities—handy, but about 120K


Multimedia—fun, but can you spare 50-80K?


Internet utilities—where will you get 120K?

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MemMaker, the memory utility that comes with DOS 6, does an OK job of delivering additional memory, but it just hasn't kept up with demanding users.

Say you wanted to run a mouse, sound card, SmartDrive, your DOS 6 and Novell utilities, and your Microsoft Bookshelf '94 CD ROM. You couldn't with MemMaker. Not unless you were willing to manually 'tune' it. And then you might end up with 490K or so to use. But QEMM 7.5 routinely returns 634K of conventional memory. And when you consider as little as one 'K' of memory makes the difference between a program loading or not, you can see where an additional 140K or so could be vital.

### Hot new features

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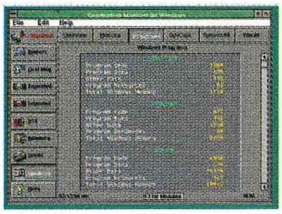
When you run DOS programs in Windows, QEMM 7.5 will provide benefits for those programs, too. Many productivity programs won't even run without it unless you sacrifice drivers and other goodies.

QEMM 7.5 comes with a new version of our award-winning memory utility, Manifest, which reports details you can't find out any other way—like how Windows and the programs running under it are using memory or what software is using your IRQs.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